THE CHATHAM ISLANDS ROCK LOBSTER INDUSTRY

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by

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CHAPTER ONE

INTRODUCTION

Definition of Areal Terms

The Chatham Islands are a group of ten islands located about the forty-fourth parallel of south latitude in the vicinity of longitude 176 degrees west. Their distance from Port Chalmers is 641.1 statute miles, from Lyttelton, 535.9 statute miles, and from Wellington, 480 statute miles.

There are three main islands in the Chathams group: Chatham (formerly given the alternative names of Wharekauri and Rekohu) of 224,000 acres, Pitt (Rangiauria) of 15,000 acres, and South-East Island (Rangatira) of about 640 acres. The remaining islands are much smaller, some little more than rock pinnacles. Only Chatham and Pitt are occupied permanently.

The name Chatham Island is commonly used for the largest island in the group in addition to being the name applied to the whole group. To avoid confusion between things pertaining to the group as a natural unit, and things pertaining specifically to the individual islands, in this report the former will be referred to as the Chatham Islands or the Chathams, and the latter as Chatham Island, Pitt Island, South-East Island, and so on.

Where it has been necessary to talk of the inhabitants of Pitt Island as a separate group, they have been called Pitt Islanders. Otherwise, Chatham Islanders (or islanders) are

the people who inhabit the Chathams. The mainland refers to mainland New Zealand (viz.; North Island, South Island and Stewart Island), and mainlanders are those people who have their permanent homes there.

Physical Background

Chatham Island is roughly T-shaped, extending some 30 miles in each direction. The southern portion of the island expands to a roughly rectangular block which reaches a height of 940 ft. along the southern coast. In contrast to this southern block, the central and northern areas are low-lying. There is little surface of the island that has not at least a superficial covering of peat which is over 40 ft. thick in places. Originally much of the surface was in forest, but little of this remains, except on the southern plateau.

For its size the Chatham Islands group has a great extent of coastline, with a great variety of coastal profile. On the north there are rugged, broken coasts cut in quartz-mica schists. Sedimentary and tuffaceous rocks out-crop on the central north coast, near Owenga and Waitangi, at various places on Pitt Island and on the north and east coasts of South-East Island. South of Waitangi, wide, flat, rectangular, wave-cut platforms are beautifully developed. Sand dunes form large stretches of the coastline, especially along the north coast and the heads of Hanson and Petre Bays.

Hydrology and Climate

The Chatham Islands lie near the zone of Subtropical Convergence and are subject to both subtropical and sub-

antarctic influences in varying degrees. This has an important bearing on the composition of the flora and fauna of the Chatham Islands, which show both subtropical and subantarctic affinities.

The average rainfall is approximately 33 inches per year, falling on 183 days. Wind frequencies show a predominance of south-westerlies, and the number of calm days averages only three per year. The main features of the weather are overcast skies and south-westerly winds, alternating with northerly winds which often bring fog and rain.

The Rock Lobster Fishery

When, in 1963, restrictive licensing of the fishing industry was abolished, there was an immediate and enthusiastic drive to develop the industry. The area for expansion was considered to be so broad that little need to control the effort, which was immediately applied in all sectors of the industry, was recognised at the time. The rapid proliferation of catching and processing units was viewed with satisfaction by policy-makers and by leader-writers in the national press, and it was widely assumed that an era of unlimited opportunity had opened up for any individual or company with resources to commit to fisheries development.

Fisheries research means many different things to different people. To the fisherman it means helping him find more fish which he can catch more easily. The boat-owner's attitude is similar, since he wants to know how he can earn a greater return on his money. The processor wants to find the most efficient

way of handling and processing a catch to meet a particular standard. Just as a government may be interested in developing the industry for the rewards of overseas funds, so the man in the street hopes that research will mean more varied and cheaper fish from retailers. All these various aspects of research ultimately become focussed in a study of the population dynamics of the fish under consideration, and become the concern of fisheries biologists. In New Zealand, until relatively recently, there have been very few of these studies and scientific development of New Zealand's fishing resources is still quite young.

This study is not a scientific or biological study, but, like them, it handles a subject which has attracted interest only recently. New Zealand fisheries have not been well documented. Since 1963 much has happened in a short time, and probably most spectacular of the new fisheries developed in this period has been the exploitation of the virgin stocks of rock lobsters at the Chatham Islands.

Exploitation at the Chathams began in 1965 and by 1966 had attained "boom" proportions. Such "bonanza" conditions are rare. Although they offer high rewards they are usually rather wasteful of both man and the resource. By nature they are also generally short-lived, but their effects may be extremely long-lasting. Seldom is one presented with "gold-rush" situations, and for this reason alone, such phenomena are worth studying and documenting while material is readily

available.

Being a separate entity with certain unique features, the Chathams allowed a study of rapid intensification of fishing effort in a relatively small, closed area in which the previous major economic activity was agriculture. Prior to the rock lobster "boom", the importance of the Chatham Islands had been historical rather than economic. The swift development of rock lobstering on the Chathams thus provides an uncommonly interesting study of a lucrative, marine-oriented, land-based industry, and its effects on an isolated social, and marginal agricultural, system. Hitherto, no similar investigation into the Chathams rock lobster industry has been undertaken.

Scientific studies are frequently made on the effects of fishing on the fish population. Very few studies are made of the effects of fishing on human populations and non-fishing activities. This study, then, fills a very important gap in fisheries research.

Sources

The statistics relating to catches, number of boats, exports, and value of exports have been mostly obtained from New Zealand Marine Department published reports (A.J.H.R. H.15) Fishing Industry Board published reports (A.J.H.R. H.15A), and have been elaborated by the inclusion of certain unpublished data from both sources. Marketing details and overseas prices have been provided by the Fishing Industry Board and the Department of Industries and Commerce. A full list of individuals and

offices which supplied information and assistance is recorded in the acknowledgements.

Some of the other material was derived from the work of other investigators in the field; for the rest, an intensive, two-month period of fieldwork at the Chathams, where, from investigations and conversations with fishermen, processors and others, both within and outside the industry, a large assortment of facts, opinions and hearsay was obtained. In interpreting this material the writer has tried to suppress any personal bias; at some points however, where facts are meagre and even tentative conclusions unwarranted, some personal opinions have been expressed.

(Note: In the rear flap of this volume, a pocket contains a copy of N.Z.M.S.1: 63,360 (Sheet 240.A.), Chatham Islands, (1969, Provisional). This map should be used in conjunction with the text).

CHAPTER TWO

SOCIO-ECONOMIC AND POLITICAL HISTORY OF CHATHAM ISLANDS

General

The economy of the Chatham Islands has been, and still is, dependent on various forms of primary production. For this reason it is impossible to understand the history of the islands unless the economy over the past two centuries is viewed in the light of sometimes violent changes in international demand. From the moment the islands made contact with the rest of the world in the Nineteenth Century the economy became dependent to a large degree on the fickleness of international markets.

Frontier Prosperity and Social Conflict

It is understood that the first known inhabitants of the Chatham Islands, the Morioris, soon ceased to be cultivators, and came to rely on fowling and fishing instead of agriculture.

> "The Morioris never quarrelled over land. Land was not cultivated at all till the arrival of the Maoris in 1835. Their only vegetable foods were the roasted root of the bracken fern, and kopi berries ..... Fish were so numerous along the shore that they could be scooped up by hand. Lakes and lagoons were full of flat-fish and eels. Young mutton-birds were in their thousands in their burrows and albatross and many other birds nested on the islets near the coast which the Morioris could reach in rafts made of flax

sticks buoyed with dried and oiled bull kelp."
(Richards E.C. 1952. p.100).

Among the other major food sources which the Moriori exploited carefully were shellfish from the shore and lagoon areas, wild ducks, especially during the moulting stage, seals, and stranded whales. Cooking was carried out in ovens of heated stones or on spits over open fires.

Thus the peaceful, conservation-minded Morioris lived in the Chathams, wandering hunter-gatherers, moving from one small forest shelter to another in search of food.

The first European contact with the Islands occurred 22 years after Captain James Cook's first voyage of discovery in the South Pacific in 1769. On the 29th of November, 1791, H.M. brig "Chatham", under the command of William Broughton, sighted land.

Although the first chart of Chatham and Pitt Islands was not finally compiled till 1816, from 1795 onwards the islands attracted whaling and sealing fleets from around the globe. The sealing gangs had almost exterminated the fur seal population by the 1830. Life was extremely hard for the shore-based sealers who clubbed bewildered seals to death in their thousands. As elsewhere, the Chatham Islands sealing boom was a short-lived affair.

In its place came spasmodic bursts of whaling activities and the Chathams became an important shore whaling base and provision depot. Traders also began to make their way from

New Zealand and Australia in search of flax and whalebone. The appearance of whalers in the Pacific Basin was prompted by the near disappearance of the North Atlantic whales due to unrestricted slaughter. Whale products were necessary commodities. Candles were made from spermacetti, oil was needed for the new machinery, and ladies and brushmakers required whalebone.

> "Owing to the destruction of the cows which came nearshore to calve, whales were scarce in Chathams waters after 1840 and by 1870, "Alaska" was the only regular visitor. In 1840 many countries had large whaling fleets in the Pacific; America had some 500 ships; England 150; France 140; and Germany 10. Only 20 of these visited the Chathams in that year".
> (Richards, E.C. P.102.)

The sealers, traders and whalers, in efforts to find new prey, or extend sources of cargo and supplies, often visited the shores of the mainland of New Zealand, particularly the areas about Cook Strait and the Bay of Islands. They carried with them promising stories of the rich, but hitherto unexploited agricultural potential of the Chatham Islands.

Mainland Maoris also heard stories about the abundant food and good land at the Chathams. In Taranaki, two sections of the Ngati Awa tribe, the Ngati Tama and the Ngati Mutunga, were dissatisfied with local conditions and afraid of the aggressive inclinations of Te Rauparaha, and hoped to migrate to the Chatham

Islands. There they hoped they would find plenty to eat and be free from conflict and oppression. They also felt assured of being able to obtain plenty of slaves since the Morioris were known to be a placid people for whom war was incompatible with the need to cooperate in order to survive. Late in 1835, the Ngati Tama and Ngati Mutunga were transported to Chatham Island in the vessel "Lord Rodney". The 900 men, women and children immediately extorted food from the Morioris, enslaved about 2,000 of them and eventually subjected them to various massacres. However, it was not long before the two Maori groups came into conflict over the sharing of the best land, and the fears of the Ngati Mutunga that the Ngati Tama would monopolise trading with the Europeans through owning all the land around Waitangi Harbour.

Subsequent history of the Chathams is marked by a series of economic successes and failures. The year of 1840 saw the arrival of Frederick Hunt, the first enterprising British settler. Hunt was disgruntled at settlement delays at Port Nicholson and after a short visit of inspection took land at Okawa Point in the north-east of Chatham Island. (Falla, 1950. p. 9). In 1842 a Church of England mission was established. This was followed by other missions, including a strong group of German Lutherans, and the setting up of a civil administration to deal with law and order in everyday affairs. Hunt moved to Pitt Island where he was joined by Regnault, while another well-known early family, the Shands, lived at

Kaingaroa close to the three German missionary families at Te Whakaru. Expanding trade developed around the export of potatoes and pork, some of which was sold to the sealers and whalers. A Lutheran missionary noted that in 1850, when the mainland Canterbury settlement was in its infancy, the mission at Te Whakaru was able to buy a small vessel and keep up trade with the mainland in grain, meat and potatoes.

> "In 1850 we had been able to buy a small craft from our earning to establish and keep up a communication with New Zealand and we kept up a smart trade before ever New Zealand had much to export in grain, meat, potatoes, passengers to the chief places in New Zealand. Every article had a good price and in return we provided the inhabitants of the island with all the necessities so that everyone felt contented and relieved from pressure, and besides this we imported many shiploads of horses from Australia."
> (J.G. Engst, 1850.)

In addition to the growing New Zealand market, the gold rush in Australia attracted many ships to the Chatham Islands for potatoes. In 1856 over 1,000 tons of potatoes and wheat were exported in this way. (Richards, E.C. 1952, p.109.)

Economic Depression in the 1860's

The boom could not last. Over-exploitation led to a decline in whaling and sealing. Australia and mainland New Zealand now began to produce their own food, with the result that

the Chatham Islands lost their position as one of the main agricultural exporters in the South Pacific. In 1861, Frederick Weld, M.P. for Cheviot, expressed concern over the position of the Chathams and asked the New Zealand House of Representatives to send an officer to the Chathams to make an investigation. A month later William Seed, on instructions from the Commissioner of Customs, was despatched to the Islands and produced a comprehensive report. Between 1851 and 1854 he noted that there had been considerable trade with the whaling fleets, and the Australian goldfield discoveries had stimulated another profitable period between 1855 and 1857. Trade fluctuations, however, were disconcerting. So bad was the market in 1859, that the whole potato crop of 2,000 tons rotted in the ground for want of purchasers. Only five vessels called from Australia, taking away 450 tons, and three New Zealand ships took off 150 tons. Instead of £6 a ton received several years previously, the price paid in 1859 was only £3, and the £1,800 received for that year's operations was almost entirely expended on urgently needed living essentials - and also, it appears, on trivialities.

The position was even worse in 1861, when the "Esther", the vessel on which Seed travelled, was the only ship to load, making three trips and taking off 732 bushels of wheat, 162 tons of potatoes and 1200 lbs of wool. The Maoris, Seed reported, were glad to receive £1 per ton for their potatoes in that year, and even then they had to carry them on board. Five years

earlier they had received £6 per ton in cash, paid for on the ground. The total value of the merchandise carried by the "Esther" was only £350, two-thirds of which was paid for in goods.

Disappointed with the disruption of the potato-growing industry, and in fear of deepening depression, some Maoris attempted to revive the whaling industry but by 1861 this too had proved unsuccessful. Only a handful of Europeans remained in place of those who had previously manned the whaling stations. There were three German settlers and their families on Chatham Island in addition to the Magistrate, Mr Shand, and his family. Hunt and Regnault were the sole occupants of Pitt. Sharing the Maori tribal life were a few Europeans who had stayed behind after the tapering off of the whaling boom. There were in all only 46 Europeans on Chatham and Pitt - 33 adults and 13 children. The Maoris, according to Seed, numbered 413, or about half the number who had migrated in 1835 from Port Nicholson aboard the "Lord Rodney". The Moriori population was down to about 160. Half-castes from European fathers numbered 17, completing an overall population figure of 636 (Simpson, 1950 p.105). The birth-rate among the Maoris and Morioris was very low, partly because of the re-migration of young Maoris, and partly because of an often inadequate and sometimes severely curtailed diet, coupled with generally squalid living conditions. This latter factor undoubtedly had a part to play in lowering resistance to disease, thus adding to an already high mortality

rate. Inevitably, the desire for a more civilized way of life, now more widespread on the mainland, drew Maoris away from the Chathams, and outmigration continued throughout the 1860's. The only substantial number of Maoris to arrive in the Islands did so under duress. Three hundred prisoners were exiled in the Chathams during the Hau Hau Wars. From 1866 to 1868 when they escaped to New Zealand with Te Kooti; the prisoners provided labour for a new group of agriculturalists, the sheepmen, who had taken up large runs.

The arrival of Chudleigh and the Ritchies, sheepfarmers with Canterbury experience, heralded a new era of European settlement based on sheep-farming.

The big runs imported prize Romneys and sold their culls to the smaller holders so that general standards were high. In 1877 at Wharekauri nearly 10,000 sheep were shorn and about 70 bales of wool were shipped. Pastoralism kept the Chatham Islands alive. Exports now became centred around wool, sheep, hides, skins and tallow. Shipping gradually improved. Some Maoris began to return after the wars, in the 1870's, and were engaged as labourers, shepherds and part-time farmers. However, like the potatoes boom before it, the pastoral boom was also to suffer a sharp reversal.

Economic Depression in the 1880's and early 1890's.

From 1870 to 1895 the economic situation in New Zealand was marked by massive borrowing, boom, and then depression. The

boom lasted till 1878 and was followed by a sharp crash and a period of retrenchment for the next ten years. A warning of what lay ahead was clearly evident when, in 1879, wool prices fell to a very discouraging level. The innovation of refrigeration in 1882 assisted with exports and it was only in this year that New Zealand's exports per capita reached the level attained in 1871. Massive immigration during the boom partly accounted for the reduced exports per capita from 1871 - 1878, but evidence of economic uncertainty in New Zealand during the 1880's and 1890's was reflected in the years 1889-90 when there was an excess of emigration over immigration for the whole of New Zealand. (Condliffe, 1959, P.40).

As on the mainland, the 1880's and 1890's were disastrous decades for the Chathams. Throughout the previous 50 years they had been one of the leading agricultural areas of New Zealand, firstly with pork, potatoes and wheat, and secondly with cattle and wool. In 1881 the Chathams still contained as many sheep as Taranaki (N.Z. Gazette, 1881, p.811), but their place in the New Zealand economy declined relatively as other areas developed. Local events of the 1880's ensured this trend: unpalatable vegetation invaded natural pastures; the weather gave its worst; disease and parasites appeared in the sheep; Maori-pakeha relations deteriorated; market prices slumped as the New Zealand depression hit the Chatham Islands.

Native grasses and herbs of the <u>tarahinau</u> peat disappeared before the onslaught of heavy stocking and continual burning

practiced by the pastoralists. The place of the edible natural vegetation was taken by coarse fire-resisting rushes and bracken fern. Native burr (bidi bidi; - Acaena novae zelandiae) grew up to eight feet tall in places and was so tenacious that it not only fouled the wool but was able to hold together the legs of unfortunate lambs. (Chudleigh, 1891, P.374). Introduced bull-rushes, blackberry, and sweet briar appeared and became well-established.

Because of their remoteness, Chatham Islands farmers and woolgrowers felt the depression far more than did their Mainland counterparts. Even with the development of refrigeration they were still at a disadvantage because they first had to tranship stock. Nor were the farmers helped by climatic extremes in 1882 and outbreaks of disease among their stock.

> "The Summer of 1882 was exceptionally dry following a very bad winter making it the most disastrous year so far experienced by the sheep-farmers. Wharekauri's tally of sheep was nearly a thousand below that of the previous season. To add to their troubles the fatal bronchial worm, Filiaria bronchitis, appeared amongst the lambs." (Richards, E.C. 1952. P.124).

Chudleigh's flock numbered 14,947 sheep, in 1881, when the disasters began. First lice were discovered, then foot-rot, and in 1882 and 1883 the Filiaria bronchitis disease killed 22 per cent and 27 per cent respectively. 1886 was the sixth year of falling wool prices, and the sixth year of high sheep mortality because of abominable weather. Although Chudleigh's

run carried 23.5 per cent of all Chatham Island sheep, he found the economic conditions oppressive and was forced to lay off some of his workers and reduce the wages of those he kept on. Credit was very hard to obtain, with the result that many men had to give up their farms. However, there seemed to be many gamblers prepared to take the place of the departed with the result that little land became unoccupied. (Weiss, 1901, p. 62-4). On the other hand, land development and improvement was impeded as experienced men were driven off the land.

Simultaneous to this economic collapse there was a break in hitherto harmonious race relations. It was true that during the Taranaki Wars the local Chathams Maoris had sent food to their relatives, and the local Chathams pakehas sent supplies to the Constabulary, yet there had been little ill-feeling on the islands. Many Europeans feared an outbreak of physical force from the many Maoris who returned to the Chathams in 1872 from Taranaki as confirmed Te Whiti-ites. In 1872 this was premature. However, in the 1880's and 1890's, the Te Whiti-ites began to threaten the livelihood of the Europeans far more subtly through passive resistance, labour troubles, and refusals to sell or lease any of the extensive native lands that remained. (R.M. Richards, 1962, p. 73).

Through this categoric refusal to cooperate, several runholders had trouble establishing clear land titles, and one or two leases were not renewed. Thus, in 1885 when some of the larger runholders attempted to have a dog-tax collected, the Maoris opposed it on principle. In Wellington the incident was

magnified into a "home rule" revolt and the Government steamer was despatched to imprison the recalcitrants. The prisoners were quite prepared to enjoy a wonderful free holiday in New Zealand each year, but at the last moment an Order-in-Council exempted the Chathams from paying the tax. (Simpson 1950, p. 159; Parl. Debates, 1885, p.61).

However, Te Whiti-ism lost much of its force after 1886 when one of the pro-European Maoris became paramount chief, and after 1890 the situation was further eased by the appointment of a Magistrate with Maori experience.

Throughout this period the "squatters" dominated the islands commercially and socially. Initially the European runholders had been a progressive, developmental group, but by this period they had regenerated to a group favouring the status quo and then into a politically and socially powerful group that resisted all change, whether progressive or not.

While the 1880's and early 1890's were dismal years, the late 1890's gave a glimmer of hope. Though the diverse exports of wool, potatoes, wheat, horses and hides had been replaced by a dependence on sheep products, average wool exports had increased as had the number of sheep, producing a whole new agricultural emphasis.

Economic Stagnation 1900 - 1945

Around 1895 New Zealand's export commodities began to realise increased prices. Wool remained the main export staple of the Chathams and some farmers also exported sheep. However, as experienced so often in the past, this short period of pros-

perity did not last. In 1900 eye disease broke out among the sheep which, coupled with several seasons of unfavourable weather, cast Chatham Islands farmers into crisis conditions again. The urgent need for a larger population, greater reserves of capital, and increased markets was stressed often. There were even thoughts of settling Boer War prisoners at the Chathams to work as labourers. The Liberal Government had, in 1894, introduced the Advances to Settlers Act, but this important article of legislation was not extended to the Chatham Islands.

In May, 1900, the Maori Land Court sat in the Chathams. The results were unfortunate. Since 1870 Maori lands had been held by 10 chiefs (grantees) whose tribal affiliations had provided a fair distribution of rent moneys and unleased land. Now that tribalism had decayed it was proposed that these grantees were now trustees and not owners, and that the remaining Maori land be subdivided and allocated individually among the whole tribe. Because so many Maoris living in New Zealand received land rights, some of the Wharekauri Block, and most of the rich Kekerione Block (from Port Hutt to Owenga), was fragmented into small, uneconomical sections. Further, the surveyors strove that, wherever possible, even the smallest blocks should have both lagoon and sea frontages. The net result was the subdivision of previous grazing leases into narrow, undersized strips which were expensive to farm and fence. Hopes of revitalising tribal ways ended. Further Maori Land Courts sat in 1901, 1906 and 1907.

Table 2.1.: Land Tenure, 1900 and 1907

	Native Land	European Freehold	Acres leased from Maoris
1900	85794	67334	37882
1907	58918	93413	38692

Sources: 1900 Florance mss. (with Native Land a residual).

1907 In papers with Ritchie and Seddon - (total acres 37 too many).

(In Richards, R.M. 1962, p.83).

When leases of the Kekerione Block expired in 1910, the Maoris did not sell out to European small-holders, but remained to farm the land individually. Thus, between large European sheepruns, there developed a chaotic jumble of Maori small-holdings, small Maori leases, and one or two small European properties.

Meanwhile, in New Zealand there were feelings that agricultural progress was dependent on the subdivision of the great estates, but in the Chathams this did not eventuate. In fact, the whole of the north-west of Chatham Island which had previously supported three couples, their 21 children and half a dozen farmhands, was consolidated into one grazing run with a manager and only one other permanent resident. Mindful of the depression of the 1880's and anticipating future pressure for subdivision, runholders left the island to inexperienced managers. What was needed was regular capital outlay and a change from the established extensive pastoralism, for the islands climate was more suited to dairying and intensive production. What it

received, however, was stagnation and bad farming.

> "Chudleigh's departure for the Waikato, leaving the station in charge of islanders, was followed by others, and by 1950 seven of the largest properties, including all four large stations on Chatham Island, and covering half the acreage of occupied land, belonged to absentee landowners. Others had sold out and returned to the mainland, and some of the old pioneering families, such as the Shands, had died out. Although the number of sheep had almost doubled since 1901, farming practice had deteriorated. Cropping for supplementary feed had been almost given up, and if it were carried out, the paddocks were not resown to good grass, but were allowed to degenerate into poor weedy pasture. The familiar process of withdrawal from outlying districts was in progress. Farms were sometimes amalgamated or the owners went to live nearer the centre of the island, returning only for mustering and shearing, as on the smaller holdings on the north coast". (Elliott, E. 1956, p.157).

Hope became based on a fishing industry with the establishment of freezers at Kaingaroa and Owenga in 1910 and 1911. This development followed a fishing and deep-sea trawling cruise of the steam-trawler "Nora Niven" which was chartered by the Government for three months, 5th June - 4th September, 1907, for the purpose of prospecting certain parts of the sea off the east

coast of New Zealand for fishing grounds. The following lengthy quotation is included here for it shows that some fishermen were operating before 1907. It also describes the prolific nature of the Chatham Islands fishery and is the earliest reference to the large quantities of rock lobsters in Chatham Islands waters.

> "The orders in regard to the Chatham Islands were: To see what the ground was like for trawling, and to test the blue cod fishing with lines. Contrary to expectations, a very considerable area of good trawling ground was found. All soundings in and to the south of Petre Bay, through Pitt Strait and in Hanson Bay showed yellow sand. Very few soundings are given on the island, but time and weather did not permit a complete trawling and sounding circuit of the island being made on this occasion. No blue cod were taken in the trawl, thus further indicating the absence of reefs near where trawling was done. Seven hauls of the trawl were made, the kinds of fish being somewhat similar, depth for depth, to those captured along the east coast of the South Island, and there is every prospect of greatly increased hauls when fishing for commercial purposes. Wherever the lines were put down large catches of blue cod were made. Almost all were of exceptionally large size, particularly those taken off Western Reef and Rabbit Island, where strong tides are experienced. Two and three blue cod and hapuka were usually pulled up as soon

as the line touched the bottom, and it was a sight to see the boats returning after a couple of hours fishing loaded to the gunwale with blue cod. Four Pitt Islanders caught 230 of the largest blue cod I have ever seen in less than an hour and a half's fishing off the north-west corner of Pitt Island. Six of the crew (of the "Nora Niven") caught 606 blue cod and 103 large hapuka, 1 trumpeter, and 1 yellowtail in seven hours off Whangaroa, and on another occasion caught 806 blue cod in three hours and a half. Almost all the men were inexperienced in the art of blue cod fishing, making the catch even more remarkable. It is extremely probable that the Chatham Islands will in the near future become one of the most important sources of our fish supply. These results may not be obtained throughout the year, but even if they are only to be had in the winter-time, these islands would prove to be most welcome at that season, during which fish are generally scarce around our own coast. Every haul made at the islands produced enormous bags of swimming crabs (Platyonichus bipustulatus) and crayfish (Jasus edwardsii), and, as a result, sacksful of crayfish were handed to the Maoris and Morioris, who regard them as special delicacies. The following additional particulars may be of benefit to those who wish to extend their operations to these islands. The distance from Wellington and Lyttelton is

about equal, being 420 (nautical) miles and from Napier about 386, or about two days steaming from any of these ports. The coastline of the islands, including Pitt Island, is about 200 miles in extent, and is much indented. The greater portion of this is rocky, and with overlying reefs in many places. Blue cod are reported to be as plentiful all round the islands as the places tested by us. There are a number of safe anchorages in which shelter can be obtained during certain winds, but the only safe one during all weathers is at Whangaroa, or Port Hutt. The harbour is only small, but the anchorage is good, and it is an ideal place for the erection of a movable freezing plant and the establishment of a fishing station. There is no bar, a thick patch of kelp extending almost across the entrance to the harbour. There are two sandy beaches for beaching boats, etc., within the harbour. The population of the islands is about 300, the majority of whom are Maoris. There are two hotels at Waitangi. Communications with Lyttelton is bi-monthly in winter, but more frequent trips are made in the summer-time. Several small shipments of blue cod packed in ice, have been sent to Lyttelton, but the service is not at present sufficiently frequent to carry on a regular trade in fish". (A.J.H.R. H.15B. 1907)

The fact that experimental trawling had, in 1907, recorded the presence of large numbers of rock lobsters at the Chathams,

appeared to go almost un-noticed. Indeed, it was not until 1965 that commercial exploitation of this species began.

Fishing was carried out by small boats supplying the factories with blue cod and groper. Local labour and immigrant fishermen from the Mainland joined in the boom which was to keep the islands "alive" through the depression of the 1930's. Up till the economically disastrous turn of events that plunged the whole world into depression in the Thirties, the export of farm produce, mainly wool, sheep and cattle continued, assisted by income derived from fishing. When the depression struck, its effects on the Chathams were immediate. Between 1930-31 and 1931-32 the total occupied area reduced by 14.3 per cent and total cultivated area by 11.4 per cent. Although wool and sheep exports remained steady, prices slumped. In 1933 one farmer only received £200 net for 80 bales of wool, £9 net for 425 good breeding ewes and £70 net from 30 top quality cattle beasts. (Richards R.M. 1962, p. 88).

Dairying, mooted as a more profitable land-use since at least 1899, did not progress beyond "house-cow" proportions until about 1924 when a dairy factory was opened at Te One. Throughout the depression this industry flourished. However, as transport charges absorbed up to 50 per cent of gross returns for butter and only 10 per cent of the gross returns from cheese, production soon switched from butter to quality cheese. ("Christchurch Press;" August 4th, 1924). (Richards R.M. 1962, p.88). Up to, and including 1933, the Te One factory averaged about 80

tons annually, ("Auckland Star", 25th March 1933), and from then till 1938 when operations ceased, annual production averaged around 60 tons. At no time were the numbers of suppliers very great, and most of the farmers who sent milk to the factory had some financial interest in its operations.

But it was fishing, rather than dairying, which sustained the Chathams through the depression. In 1933 a Wellington-based steam-trawler, S.S. "South Seas" fished in Chathams waters and also acted as a fish carrier to her home port. (A.J.H.R. H.15 1934-5). With better distribution and better marketing, the local fleet increased to 18, and production rose after 1934 to average 11,600 cwt, with a peak of 25,212 cwt in 1936. The following table shows quite clearly trends in annual catch, number employed and the number of boats fishing.

Table 2.2 Chatham Islands Fishery, 1925 - 1940

Year	Catch (cwt)	Number employed in fishing industry			Number of boats fishing
		fishermen	others	total	
1925	4,074	24	12	36	10
1926	4,775	-	-	-	-
1927	1,283	-	-	-	-
1928	-	-	-	-	-
1929	6,867	-	-	-	-
1930	12,359	34	14	48	12
1931	7,433	33	14	47	12
1932	2,937	28	14	42	9
1933	-	-	-	-	17

Year	Catch (cwt)	Number employed in fishing industry			Number of boats fishing
		fishermen	others	total	
1934	17,251[1]	44	15	59	-
1935	13,539[1]	69	15	84	18
1936	25,212[1]	80	15	95	18
1937	15,106[1]	63	12	75	17
1938	15,996[1]	58	6	64	15
1939	13,660[1]	53	6	59	13
1940	-	51	6	57	12

Source: Marine Dept. Reports A.J.H.R. (H-15) 1925-1940.

[1]Includes some fish processed at sea and landed direct to Wellington.

- = no data.

As the only activity offering a fairly stable income, fishing became so popular that in 1935-1936 there were probably around 200 people living about the Kaingaroa and Owenga freezers.

During the depression the total population of the Chatham Islands increased quite significantly since the inhabitants could live adequately off "the fat of the land". In 1926 the population of the Chathams group was 456, composed of 300 Maoris and 156 Europeans. By 1936 the total numbers had risen to about 700, of whom only 300 were Maoris compared to approximately 400 Europeans. It could be construed that nominally the Maori population remained stationary during that decade, while the European population increased by about 176 per cent, but it is possible that the increase in European figures is accounted for largely by children of Maori descent. A few disillusioned islanders were drawn home and there was no

impetus for out-migration to the equally depressed mainland. (Harvey, Judge; 1936, p.3).

Ready cash was scarce throughout the 'Thirties which led to widespread inability to meet the land tax which had been introduced in 1925 amid much disfavour. Fears of incurring taxation had long provided opposition to accepting Parliamentary and County franchise. This was particularly the attitude of the runholders. Despite these fears, Parliamentary representation was awarded in 1922, when the Chathams were included in the Lyttelton electorate, and in 1925 a County Council was elected. That the Chatham Islands had been actually constituted a county under the Counties Act, 1888, by the Chatham Islands County Act, 1901, and the first Council was not elected till 1925, is ample evidence of the opposition to County status. By 1935 there was strong dissatisfaction with the operations of the Chatham Islands County Council, both financial and otherwise, since the Council was in extreme financial embarrassment through lack of funds, arising mainly through non-payment of rates and expensive wharf development. This particular problem was subject of an on-the-spot investigation by Judge Harvey of the Native Land Court. This investigation developed into an enquiry into the financial position of the Islands generally. As a result of Harvey's report, the Chatham Islands Empowering Act, 1936, was enacted which empowered the Chatham Islands County Council to obtain its revenue from dues on imports and exports instead of the normal method of rating on land which

operated up to that time. The land rating powers of the Council were suspended from April 1st, 1937. The import and export dues chosen, however, were rather unfortunate for on £20 worth of wool the C.I.C.C. (Chatham Islands County Council) received 4/6 while for £20 worth of sheep it received £1-15-0. Developmental equipment such as fencing, seed and fertilisers apparently received no preferential treatment.

> "On an ad valorem basis the farmer who exports sheep pays a higher levy than the farmer who only exports wool. The critical aspect of this is that, in practice, the levy falls most heavily upon the farmer who uses his land to the best advantage". (Connell, R.P. 1938).

In other words this system, still in force today, remains a hindrance to development, since the more the good farmer exports or imports, the more he has to pay in levies, while the farmer who carries out no improvements or allows his land to lie idle, pays little, for his total imports and exports are small.

After the Depression, economic conditions in the Chathams improved, but the Islands were relatively "backward" compared to New Zealand. Curiously though, after their success during the depression, both dairying and fishing declined. In the fishing industry, decline was due to a fall in prices on the New Zealand mainland and in Australia, the major overseas market. The Australian market slump was due in part to competition from South African producers. The Owenga freezer closed in 1938, and in 1941 the Wellington-based trawler and fish carrier "South Seas"

was withdrawn for war duty. The Kaingaroa freezer fell into disrepair and from 1938-46 the Chatham Islands' catch of fish fell below 200 tons.

Dairying, the other stalwart through the depression years, ceased to be any more than a domestic activity after 1938, when the Huro Cheese Factory at Te One closed. Closure was ostensibly due to high freight costs, but there had also been a rise in the relative prices being paid for sheep and wool and labour was in chronically short supply.

Table of total landings, total value, and employment in catching sector of Chatham Islands fishing industry, 1936 - 1956.

Table 2.3

Year	Total Landings (cwt)	Total Value £	Total No. of[2] fishermen employed
1936[1]	17,279	7,227	80
1937[1]	6,373	4,565	63
1938	6,448	3,808	58
1939	2,299	1,285	53
1940	-	-	51
1941	3,702	2,165	49
1942	3,908	2,637	-
1943	-	-	-
1944	4,326	3,322	26
1945	4,420	3,721	23
1946	3,586	3,278	8
1947	9,412	12,248	16
1948	12,490	15,262	12

Year	Total Landings (cwt)	Total Value £	Total No. of[2] fishermen employed
1949	7,816	9,020	19
1950	9,718	11,121	15
1951	10,096	13,672	26
1952	11,366	16,388	21
1953	14,072	19,778	29
1954	12,515	22,959	38
1955	7,491	10,515	32
1956	13,162	18,439	40

[1]Excludes fish landed direct to Wellington.

[2]Includes full-time and part-time fishermen only; i.e. not factory or freezer-staff.

- Signifies no data.

(Source: Marine Dept. Reports. A.J.H.R. H-15. 1936-1956)

While dairying and fishing declined, the status of agriculture became relatively more important again. Through the depression much of the marginal lands were abandoned, and although many areas were not re-occupied as farming emerged from the depression, production increased on established pastures. The increase was achieved through a more intensive use of the better areas. For example, Kaingaroa Station increased its sheep exports by 50 per cent from 1927 - 1936, and wool exports were increased by 40 per cent in the same time period. This was accomplished despite a flock increase of only 200 (I.E. from 6,000 sheep in 1927 to 6,200 in 1936). (Connell, R.P. 1938, p.8)

A report of 1938 (Connell, R.P. 1938) attempted to illustrate the fact that the land resources of the Chathams were grossly unused. The Chathams region was compared with Rangitikei County in the north-western part of Wellington province. The County was selected for comparison since it had a number of important features in common with the Chatham Islands:

(i). The climates did not differ in basic respects, both being relatively mild districts of rainforest condition;

(ii). Both areas were mostly engaged in sheep-farming;

(iii). In both areas there were considerable portions in which cattle were used in pasture management.

Despite these outward similarities, Connell noted three major points of comparison. Firstly, Rangitikei carried one cattle beast to every six or seven acres occupied. The Chatham Islands had one cattle beast to every 48 acres occupied. In both counties the dairy cattle comprised about 25 per cent of all cattle. Secondly, the number of sheep in Rangitikei was 14 times as great as that in the Chatham Islands; while the number of cattle was 40 times as great as that in the Chathams. The third difference, Connell noted, was that the acreage of old sown pasture in Rangitikei was 27 times as great as that in the Chatham Islands, while the acreage of new sown pasture was 61 times as great. The report noted that, since other factors entered in, the comparisons were not necessarily completely valid, "but the comparisons certainly should provide farmers of Chatham

Islands with some food for thought". (Connell R.P. 1938, p.9).

In general, throughout the 1900-1945 period, the keynote was stagnation. The export value of cattle gradually declined to a point where they were ignored and roamed semi-wild in the scrub. As exemplified by Kaingaroa, sheep-flocks increased only slowly. Farms suffered under a shortage of essential stock shelter and there was inadequate wood available for fuel and fence posts. The major underlying reasons for this agricultural stagnation were inadequate shipping, insufficient roads, and inadequate social amenities.

During the previous century, in relation to the size of the population and the freight offered, the Chatham Islands had been well served as coastal shipping boomed and vessels were plentiful. Despite many wrecks among the sailing ships, there was little obvious discouragement to shippers, but as the steamship era opened there was a decline in coastal trading vessels. The Chatham Islands were one of the first places to suffer from a shortage of ships. On the whole, ever since steamers displaced coastal sailing ships, the Chatham Islanders have (and, many claim, continue to,) suffered from a shipping service that is irregular, unreliable and expensive. On the average, about 10 calls were made every year. More frequent visits would be made in the summer to uplift stock and wool, but the islands were often isolated for many months in winter-time. Of the 10 trips per year to the Islands, Pitt Island would be visited on only two of them and on only one occasion every year would the outstations

along the northern coast be a port-of-call, mainly to uplift wool. After 1934, when the County Council imposed a special wharf levy, and 1937, when import and export dues were exacted, further restraints were placed on trade. Although the Waitangi wharf was completed in 1934 providing greatly improved loading facilities, it was poorly sited, poorly designed and of extravagant construction and proportions. A vicious circle developed. Shipping agents could not be stimulated to improve the service when exports were doubtful. On the other hand local farmers who wanted to develop their lands were increasingly discouraged by the fact that the shipping service to the markets in New Zealand was so erratic.

Internal transport up to the end of the Second World War was extremely primitive. The interior road lines, mostly unfenced, traversed largely clayey soils or peat bogs which were almost impassable in winter. The 11-mile Waitangi-Owenga trip was a full-day ordeal. "Surveyed roads" shown on official maps bore little relation to reality. Absence of formed roads had an important bearing on the social and economic life of the islands. It prevented free social intercourse and the holding of stock sales, agricultural shows, church services, sports meetings and other functions. Motorised equipment was of little use and the major forms of haulage and conveyance were oxen and horses.

Housing was generally poor, and, in comparison with the rest of New Zealand, social utilities such as schools, libraries, halls

and other recreational facilities were inadequate.

> "Comparing Chatham Island housing with that on the mainland, I could perhaps sum it up by saying that the European house resembles the average thirty-year-old four-to-six room outback residence, while the predominant Maori type resembles a seaside shanty that has been built up of a number of old roadmen's corrugated iron huts. Of course there are various intermediate stages and quite a few exceptions to the general rule". (Simpson, F. 1950, p.139).

Islanders have long had a high rate of natural increase with considerable "exporting" of children to New Zealand. The 1945 census, at the close of the period under review, showed almost half of the population as being under 20 years of age. Among the permanent island residents, the effects of poor internal communications often manifested itself in the formation of small introspective groups. Tiny, dispersed schools further restricted decisive combined action by accentuating trends of disunity. (Richards, R.M. 1962, p.92).

While it cannot be denied that some agricultural expansion occurred in the 1900-1945 period and that there were some improvements of social amenities over the years, the rate of development and change was slight compared with that in New Zealand. It was during this period that the Chathams became known as a backwater.

The Chatham Islands after 1945

After World War II, 1939 to 1945, came a period that was markedly in contrast with pre-war market uncertainty. New

Zealand's exports of primary produce enjoyed peak demand and high prices. Large increases in production of sheep and dairy goods reflected world-wide demand.

The Chatham Islands shared in this new prosperity. Most revolutionary changes in the islands took place in transport and communications. In 1927 one motor truck arrived on the islands. This was followed by four motor-cars in 1939. In a roadless community these vehicles were little more than toys. Tractors and mechanised farm machinery did not appear until 1946 when a Public Works Department team started road-building. Waitangi's importance as the centre of the islands' community life was enhanced by being the focus for the 30 miles basic network of roads which connected it with Owenga, Te Ngaio and Te Roto by 1949. Lack of shingle beds or other adequate road metal presented a problem for road-builders, who were forced to compromise by using one or more of the three available materials - limestone, shell, and crushed cliff rock. Particular difficulty was encountered on the peaty Owenga route which was only overcome by the engineers laying down a network of tree-trunk sleepers and filling the gaps with shell and crushed rock. The road, more or less, had to be "floated" across the bogs. Roading development was slow and expensive. By 1955, although there were 187 miles of surveyed roads, rough formation work had been carried out on about 90 miles, but on only the 30-mile Owenga-Te Ngaio-Te Roto-Waitangi network was there any attempt to metal the surface. The north-east and north-western areas remained

relatively isolated as roads were not extended as far as these settlements. The journey from Waitangi to Matarakau and Kaingaroa was relatively arduous in summer and generally impossible in winter.

However, improved access to the wharf at Waitangi was a great boon to farming as this post-war period saw a full recovery of agriculture. A good quality wool was produced, and Chatham Island sheep enjoyed a good reputation as disease-free, quality stock. As such they earned good prices when shipped to the Mainland. (Madden, 1955). Improved shipping, the new roads, and increases in the price of wool produced a new spirit of enterprise and allowed the purchase of vehicles, implements and fencing materials. Pastures were re-sown and land was brought into production.

Improved access to Waitangi also led to great changes in the way-of-life of many Islanders. Social contact became easier and more flexible, while the larger number of social gatherings induced less disunity and diminished the need for self-sufficiency among family units. Horses were soon replaced by cars, trucks and land rovers so that by 1960, there were 28 registered vehicles per 100 islanders.

As a result of increased production and more favourable market conditions a more regular shipping service evolved. An adequate service was a key factor in the development of the islands during this period. Government subsidies were paid to shippers in 1941 and from 1945 to 1948. In 1959, three

years after Holm & Co. had built a special vessel, Government again introduced subsidies to an annual value of £14,000 in order to ensure the service was adequate. This better-timed, regular service helped with export of sheep, wool and cattle which were sent to the mainland to coincide with top Addington prices. Economic and social ties with Canterbury were still strong, as shown by the 200 passenger-trips in 1960.

After spasmodic flights during the war, an irregular flying-boat service began in late 1950 from Wellington. Passenger transport patronised the flights which took two and a half hours compared with two and a half days by boat. From 1959 to 1967 the flying boat service provided about 12 trips per year, and in 1960 there were 316 passenger trips out of a population of 500. A crisis arose in 1967 when the flying boat service was suspended because the Sunderland aircraft had reached the end of their economic use. Reliance on maritime transport was avoided in 1968 when the Te Hapupu airstrip was licensed and Safe Air Limited was granted a Government subsidy to provide at least one weekly service carrying passengers and some freight and mails. The problem of the remote location of Te Hapupu airfield remained however.

In the early 1960s prices earned for wool dropped alarmingly. After reaching a peak in the 1963-1964 season the New Zealand average auction price dropped markedly:

Table 2.4 Average N.Z. auction price for wool 1963-4 to 1966-7.

Season	New Zealand Average Auction price (Cents per lb.)
1963-64	45.89
1964-65	35.12
1965-66	34.68
1966-67	29.39

(Source - A.J.H.R. B-4, 1968).

Because Chatham Islands farmers had the freight cost to New Zealand to add to their production costs, they immediately began to feel the squeeze. Stock prices on the Addington market dropped to such a level that some farmers received debit notes for their sheep instead of cheques. Romney wool, after the high marketing and freight rates had been deducted, was netting about 14 cents per pound. For the farmer it cost about 36 dollars per bale to market the wool. This cost included shearing, transport, shipping, county rate, commission etc. Since sheep prices were so low, some farmers had to send their best sheep to the mainland to ensure a reasonable income. This immediately produced a situation in which the flock quality was endangered. Several farmers required assistance under the Marginal Lands Act. (D. Reid, R.M. pers.comm. 1970), but fortunately the establishment of a local freezing works and the rock lobster industry gave farmers the opportunity to make good their failures in wool and stock sales.

Once again, the economic emphasis of the Chatham Islands

was to change. Previously, whaling and sealing, wheat and potatoes, and wool, sheep and cattle had been the mainstay of the Chathams economy. In 1965 the sea again was to provide income and employment on the Chatham Islands in the form of a lucrative rock lobster fishery.

CHAPTER THREE

Rock Lobster Distribution in New Zealand and Biological Notes

Only two species of rock lobsters (marine crayfish) are found in New Zealand's coastal and offshore islands waters. Both of these belong to the widespread Southern Hemisphere genus Jasus. The valid scientific names, synonyms and standard common names are given in the following table. (Kensler, 1967(d)).

Table 3.1

Valid Scientific Name	Synonyms	Standard Common Names
Jasus edwardsii	J. lalandii	rock lobster
	J. lalandii frontalis	red crayfish
		spiny crayfish
		common crayfish
Jasus verreauxi	J. hugelii	rock lobster
	J. tumidus	pack horse crayfish
		green crayfish
		smooth-tailed crayfish

The more common of the two species is J. edwardsii (Hutton, 1875), which Holtius (1963) reported as endemic to New Zealand. This species is readily distinguished by its reddish brown colouration, and narrow spiny carapace which is always much shorter than the abdomen. Squamiform sculpturing characterises the dorsal surface of each abdominal somite. (Plates 3.1 and 3.2).

J. verreauxi (H. Milne Edwards, 1851), the "packhorse" crayfish, is not as common as J. edwardsii, but, unlike the latter,

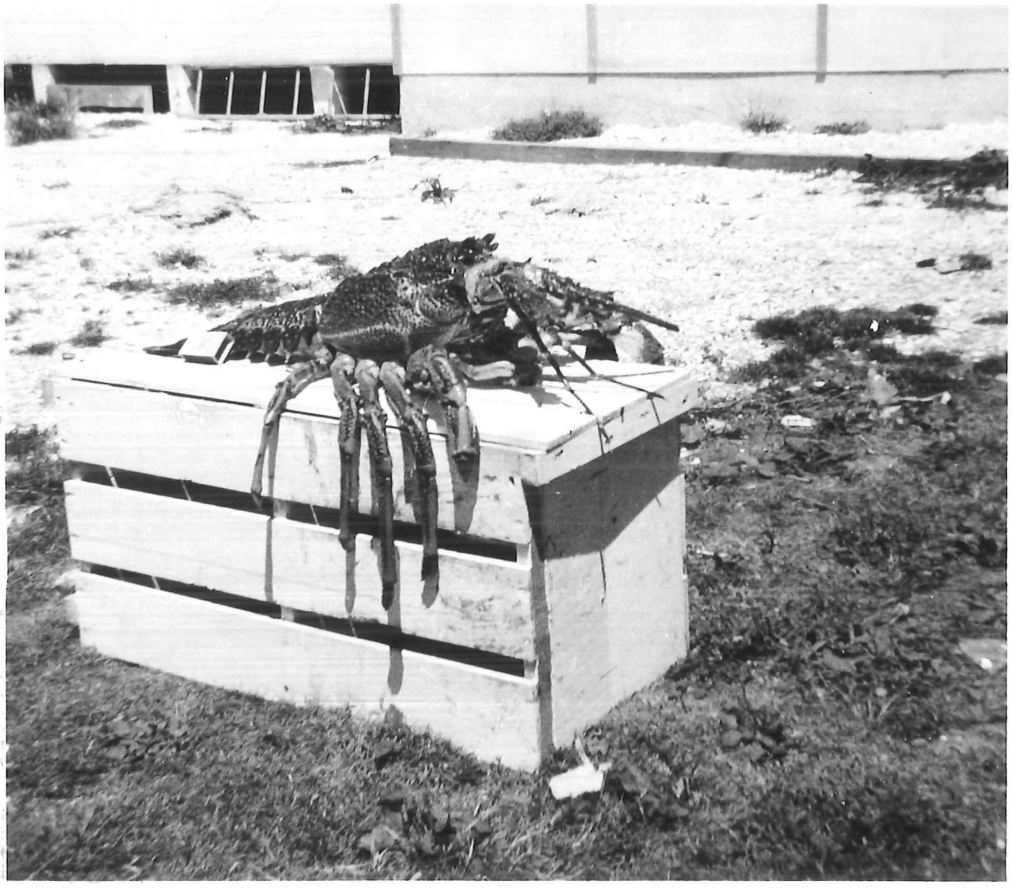


PLATE 3.1. Large male specimen of *Jasus edwardsii*, Owenga, Chatham Islands, 1970

PLATE 3.2. Large male specimen of *Jasus edwardsii*, Owenga, Chatham Island, 1970. Factory staff accommodation block in background.

is also found in waters outside New Zealand, mainly on the New South Wales and adjacent coasts of Australia. J. verreauxi differs from J. edwardsii in that it has a wide carapace which is only slightly shorter than the abdomen, and is coloured green in smaller individuals and yellowish brown in larger specimens. The dorsal surface of each abdominal somite is smooth.

The broad distribution of each species varies. Seldom are both species found in the same locality, although they may both inhabit the same general area of coastline. J. edwardsii is almost always caught on a rocky substrate, but at the Chathams is also found on a sand or shell bottom. J. verreauxi is usually caught on a sand or gravel substrate, although smaller, immature specimens can sometimes be taken around rocky localities. (Kensler, 1967(c)).

In the North Island J. edwardsii is considerably more abundant on the east coast than on the west coast. It is found along all suitable rocky coastlines on the east coast, and becomes more abundant with increasing distance south, reaching the peak of its North Island commercial abundance around the rocky coasts of Gisborne, Napier, Castlepoint and Wellington. (Marine Department Report, 1968).

Table 3.2 Major Ports of landing of J. edwardsii - North Island, 1968.

Coromandel	265 cwt.
Mercury Bay	2515 "
Tauranga	1081 "
Whakatane	1860 "

Gisborne	7514 cwt.
Napier	6469 "
Castlepoint	3376 "
Wellington	3541 "

Source. Marine Dept. Report, 1968.

Along the west coast of the North Island distribution of J. edwardsii is sparse and sporadic.

In the South Island J. edwardsii is much more common than in the North Island, but shows a similar increase in abundance with distance south along suitable rocky coastlines from Kaikoura to the Otago Peninsula on the east coast, and from Cape Farewell to Jackson Bay on the West coast. The species reaches its South Island peak of abundance in the south-west region, i.e. the area extending from Bluff (including Stewart Island) westward around Fiordland up to Jackson Bay. J. edwardsii is the only variety present at the Chatham Islands, but is present in large quantities.

J. verreauxi, the "packhorse" crayfish, appears to be limited in its New Zealand distribution to the warmer northern waters of the North Island. (Kensler, 1967. (a). (b). (c)). The species is present in limited numbers at the Three Kings Islands, but is commonly found in the region from Cape Maria van Dieman south-east to Cape Runaway. Within this region it reaches its present peak of abundance in the small area between Cape Maria van Dieman and North Cape, where 80 per cent of the total New Zealand landings of J. verreauxi in 1966 were caught. (Kensler

and Skrzynski, in prep.). Elsewhere in the North Island J. verreauxi is present in small quantities, mostly north of Cape Runaway. Until recently there had been no reports of J. verreauxi being caught in South Island waters. However, in 1966, six immature specimens were accidentally taken by a commercial fisherman trawling in Foveaux Strait. The species apparently reaches its southernmost limit of distribution near Bluff.

Being fewer in number and more limited in distribution, J. verreauxi makes up only about one per cent of the total landings of rock lobsters (crayfish) in New Zealand. The overriding significance of J. edwardsii is obvious, since the lucrative rock lobster fishing industry in this country is based almost entirely on this one species which presently exists, in the greatest known concentration in New Zealand, in the waters of the Chatham Islands.

Studies of growth, moulting cycle and migration of J. edwardsii have been rather limited until recently, when it became accepted that these aspects of rock lobster biology are fundamental to any study of the fishery. (Street 1969, Sorenson 1969). Sorenson (p.17) used the following table which covers events in New Zealand as a whole in a general way, but admits some over-lapping from district to district and season to season. (Table 3.3.)

Table 3.3. Annual Cycle of the New Zealand Rock Lobster.

Month	Male	Female
Jan.	Some males, but few, in old shell.	Females predominate inshore.
Feb.	Males taken in small numbers	Females coming in to shed shell.
Mar.	Males increase. Mating with females begins.	Females inshore shelling.
Apr.	Mating with females, few caught.	Egg extrusion begins; few caught.
May	Males predominate.	All mature females "in berry". (i.e. carrying eggs).
June	Equal numbers of females and males.	Egg hatching by early females begins.
July	Equal numbers of females and males. Increased numbers of large males.	Females shedding eggs.
Aug.	Equal numbers of females and males. Further increase of large males.	Females shedding eggs.
Sep.	Large males in greatest numbers.	Advanced egg shedding; increases in numbers of large females.
Oct.	Males decrease in numbers; moult commences.	Almost all females have shed their eggs.
Nov.	Males in new shell move out.	Significant number of "spent" females present.
Dec.	Any males present in new shell.	Females now all free of eggs.

In order to establish the growth rate of rock lobsters it is necessary to know the length increase at each moult, and the number of moults which occur per year. Young (1926) kept a small rock lobster for three years at the Portobello Marine Biological Station, Dunedin, and noted that there was no

appreciable regularity in casting of the shell, but that ecdysis (moulting) occurred at longer intervals during the colder months, when less food was taken. He claimed that ".... the temperature of the water influences the feeding of the crayfish almost as much as the abundance or otherwise of its food...." (Young, 1926). From Young's table of growth rate, it appears that the rock lobster grew from 4.2 cm. to 14.0 cm. in a little over three years, shedding its shell eight times in the process. Over the three-year period this rock lobster gained almost $3\frac{7}{8}$ inches, at a rate of almost $1\frac{1}{3}$ inches per annum. This rate of growth does not appear to be sustained among larger specimens. Sorenson (1969) reports that in Stewart Island the mean total length increase for rock lobsters below 9 inches overall length was 0.7 inches per moult. Rock lobsters from 9 to 9.6 inches overall length showed length increases at an average of 0.6 inches per moult. Similar trends of smaller increase in size per moult, with larger overall dimensions, were reported at George Sound, Long-beach and Karitane, and Nugget Point. (Sorenson, 1969).

Rock lobster fishing in any area is a seasonal occurrence. It is important to know how the moulting and mating cycles influence the fishing patterns. In the pre-moult condition, pigments for the new shell cause a pink colouration in the flesh of the crayfish. As the rock lobster approaches closer to the moult the colouring of the flesh increases and the animal becomes less active, finally ceasing to feed.

"Observations indicated that crayfish cease feeding

> about seven weeks before they moult (during which time they do not enter the pots), and after moulting they remain inactive for about another two and a half weeks; they are therefore off food for approximately nine and a half weeks over the moulting cycle". (Street, 1969, p.15).

The intermoult condition of rock lobsters is that period from the time shells have hardened until the approach of the next moulting period. Seasonal moulting patterns vary between the sexes and stages of life cycle. Two different groups exist. One group consists of small and medium-sized males and immature females; and the other group is made up of mature males and females. The seasonal pattern of fishing is influenced to a marked extent by the various periods of the year when moulting takes place. These seasonal differences according to size, sex and state of maturity, in effect, cause natural closed seasons when crayfish will not enter the traps because of moulting periods.

Recently moulted rock lobsters feed actively with the result that peak catches normally follow a moulting period. This applies particularly to small and medium-sized males and immature females. Although mature females are plentiful at this period, they are carrying eggs, and must be returned live to the sea. In the Chathams, because large male rock lobsters were relatively abundant, large catches were usually made in the months of July and August, several months prior to their

moulting period. (See Table 3.3). After a period of moulting, catches are further increased by growth, since previously undersized rock lobsters are recruited to the catch, and animals already over the legal limit have likewise increased in size.

Slight variations in the moulting period from year to year may account for the early or late "runs" that take place. Variations in the time of rock lobster "runs" in different areas may likewise be due to differences in moulting periods.

Sound fisheries management requires knowledge about rock lobster populations, particularly whether fish in different areas remain separate, or whether they move from one region to another. Two patterns of rock lobster movement have been revealed by underwater observations, the examination of commercial catches, and by marking experiments. The first of these is a seasonal movement which entails movement to heavily creviced rough bottom for moulting, and dispersal from such ground after moulting. In a tagging experiment, Street (1969) noted that 2 months after marking, the proportion of rock lobsters which moved more than five miles was 19 per cent. Considerable areas of sand were crossed in the course of these migrations. The first appearance of "new shell" fish in pots is due to a resumption of feeding following moulting and shell-hardening. Initial movement from heavy creviced areas may take place. The results of the tagging experiment showed that while the majority of rock lobsters remain local to one area, considerable migrations are made by individuals or groups.

Some mixing of rock lobster stocks from different areas therefore takes place. This is important when considering whether fishing operations in a given area will affect stocks in neighbouring areas. Although extraordinary movements of rock lobsters of up to 250 miles have been recorded, ("Commercial Fishing," July 1969), it is extremely unlikely that there is any post-larval migration of rock lobsters from New Zealand to the Chathams, or vice versa.

Octopuses are a natural enemy of rock lobsters and cause considerable loss to fishermen by eating pot-caught fish. Rock lobsters have also been observed in the stomach contents of blue cod, groper, dogfish, conger eels and seals. They are particularly vulnerable in the "soft-shell" state. (Plate 3.3).

All facets of the life-cycle of both sexes of rock lobsters have considerable effect on the seasonal nature of this branch of the fishing industry, and the fishing practice used to catch them.

PLATE 3.3. Rock lobster pot being swung aboard "San Marie" off Tapuaranga Reef, Chatham Island. Note the presence of predators, two large conger eels, and absence of rock lobsters.

CHAPTER FOUR

Development of Rock Lobster Fishing

Trends in New Zealand's Fishing Policy

If one takes fishing in its broadest sense to mean the exploitation of an aquatic resource, then the fishing industry in New Zealand was probably triggered off by reports in Captain Cook's journals of sightings of whales in New Zealand waters. Despite the resulting interest in New Zealand by Whalers, who virtually exterminated their resource, probably the most notable feature of New Zealand's fishing legislation up to 1961 was the emphasis on protection and conservation rather than development of the industry. This is exemplified by the Oyster Fisheries Act (1886) which was more concerned with imposing penalties than increasing production; under one of its sections half the penalties exacted were to go to the informers.

The general administration of New Zealand's sea and freshwater fisheries is the responsibility of the Minister of Marine and of the Marine Department under powers given by the Fisheries Act, (1908). Briefly, the Marine Department, through its functions, virtually controls every phase of fishing activity, which has meant control over the fishery product generally, industry structure, scope and variety of operation, and the quality and presentation of fish for the New Zealand market and for export. The reasoning behind placing all fisheries matters in the hands of the Marine Department appears to have been that as this enterprise was carried out from boats, then it was logical that it should be administered by the same

department which dealt with other maritime affairs. Ever since this decision was made in 1908, its appropriateness has been questioned, because, in New Zealand,

> ".... unlike the situation in most other countries, fisheries have not been linked with agriculture as a branch of primary production, and the fishing industry has not benefited from many of the measures brought in to promote the development of primary production. This has probably retarded the rate of development of the industry". (Slack, E.B. (ed). 1969).

Government initiative in arranging exploratory surveys of fishing grounds by chartered vessels like the "Doto" (1900 and 1901), "Rita" (1901), and the "Nora Niven" (1907), appears to have led to a period of expansion in the fishing industry from 1900 to 1910. By 1911, however, fear of over-fishing in some areas was expressed by the Chief Inspector of Fisheries, Mr Ayson, (A.J.H.R. H.15. 1911). Despite this, Mr Ayson was a courageous supporter of fisheries development.

On his retirement in 1926, Mr Ayson was succeeded by a new Inspector of Fisheries, Mr A.E. Hefford, who held different views on fisheries resource management. Hefford's 1927 report (A.J.H.R. H.15. 1927) discussed measures to regulate exploitation "... so that it does not cut too deeply into the reserve that must be maintained to ensure adequate stocks for the future". Hefford remained Chief Inspector of Fisheries until 1946, continually preaching alarm at depletion of stocks, often basing his views on inadequate statistics (A.J.H.R. H.15. 1930).

Some areas were closed to trawling and the use of Danish Seines was restricted.

> "It is not surprising therefore, that under an administration dominated by Hefford, ... those Members (of Parliament) who read Marine Department Reports became increasingly influenced by the prophecies of gloom attendant over fishing". (Slack (ed.) 1969).

The influence of Hefford remained strong in the Marine Department. The Report of the Caucus Fisheries Committee, 1956, recommended that

> "..... the present measures of conservation be retained, and that immediate steps be taken for regular consultation between the Marine Department and the industry on further conservation measures". (A.J.H.R. H.15.A. 1956).

This Committee also envisaged that surpluses for export would steadily decline and eventually cease.

However, the appearance of Japanese fishing vessels around New Zealand coasts, from 1959 onwards, contributed to a re-appraisal of the usefulness of the system of restrictive licensing (which had been introduced in 1936), and gave support to Professor L.R. Richardson who, since his arrival from Canada in the 1950's claimed that the New Zealand industry was capable of considerable expansion.

By 1961 Government interest in fishing had advanced to the stage where a Select Committee was appointed. Arising from the

recommendations of this Committee two major acts were passed in 1963. The Fisheries Amendment Act (1963) repealed restrictive licensing, and provision was made to allow any person normally resident in New Zealand to enter the catching sector. Companies with over 50 per cent New Zealand control could also enter the catching sector. The other major article of legislation to arise from the 1961 Committee's recommendations was the Fishing Industry Board Act (1963). The functions of the Board were laid down in Section 10 of the Act, and may be summarised as follows:-

(i) promote New Zealand's fishing industry;

(ii) promote exports;

(iii) promote supply;

(iv) promote high standards;

(v) resolve production problems;

(vi) promote co-ordination in all sectors of fishing;

(vii) promote means of obtaining finance;

(viii) report to the Minister of Marine about trends and prospects of overseas markets, and the economic stability of the fishing industry.

From 1963 onwards it is therefore apparent that there was an altogether different, and more determined attitude, towards fishery development amongst members of the Government and members of staff of Government Departments. The extension of New Zealand's territorial waters boundary, from three miles to twelve miles, was representative of this new effort. This was matched in the private sector by a rising tide of enthusiasm. New gear and methods were demonstrated to fishermen, who, in

turn, experimented with them. The activities in research were stepped up with new research vessels and work on processing and food technology. The Government responded again with improved organisation, and the Supplementary Loans and Mortgage Guarantee Scheme was introduced in 1965 to help independent fishermen buy new fishing vessels. Many took advantage of the opportunity.

Evidence of the present faith in the place of the fishing industry in the New Zealand economy is clearly shown in the National Development Conference targets for the fishing industry, which project a rise in export earnings from $9 million in 1967-8 to $13 million in 1972-3 reaching $25 million in 1978-79.

Position of Rock Lobster Fishing prior to Chatham Islands Development

As the fishing industry got under way after the war years there was at first a marked increase in the quantity of wet fish produced. This was due in part to the resting of the grounds, and in part to the replacement of power units, re-equipping and replacement of boats, particularly major units. During 1947, 1948 and 1949, these increases showed a marked tendency to taper off as the increased fishing potential stabilised itself at the higher level of production. This tapering off continued in 1950 and was apparent at all ports, but was not solely a reflection of adjustment of catch to available stocks. Of very great importance was the switch of many boats away from catching wet fish to a concentration on rock lobster fishing, with a view to capitalise on the buoyant export market for rock lobster tails.

With the development of the export of frozen tails to the

United States of America (about 1948) and the high price received for this product, the increase in the catch of rock lobsters was phenomenal. The peak pre-war total catch of rock lobsters was 12,212 cwt. By 1950 it had reached 52,506 cwt.

A feature that first showed itself prominently in 1950, was that while fishermen received £169,138 for the 52,506 cwt. they landed, the 67 per cent of this that was processed and exported (mainly as frozen tails), returned £199,930. In other words, the value of that part of the catch that was exported exceeded the total value of the "landed" catch by £29,992. By comparison, in 1951, 88 per cent of the rock lobster catch was exported. The fishermen, in landing 55,658 cwt. earned £216,854, while the 88 per cent that was exported returned £370,199, which was £153,235 in excess of the catch as produced. The incentive that brought about the increase in rock lobster landings is obvious.

Of all the areas of New Zealand that experienced the upsurge in rock lobster fishing activity, none were more spectacularly affected than the area of coast from Jackson Bay round to Bluff and Stewart Island. In 1953, Bluff, the major point of landing for the area, in spite of a very appreciable increase in fishing potential as represented by a number of new and bigger vessels, the fleet was producing only about 40 per cent of its average weight of wet fish. On the other hand, Bluff landings of rock lobsters in 1953 were more than double those of 1952. During the early 1950's, the several-fold increase in

the prices being paid for rock lobster tails made this fish the most valuable single species of fish ever produced in New Zealand. In 1954 a new record catch of rock lobsters was taken. The prominence of Bluff-Stewart Island was clearly established when 52 per cent of the total New Zealand rock lobster landings were accredited to Bluff in 1954.

Table 4.1. Rock Lobster landings (Bluff-Stewart Is.) and Exports of Frozen Rock Lobster, (New Zealand). 1945-1969.

	Bluff - Stewart Is.		Exports of Frozen Rock Lobster N.Z.	
	cwt.	value £	cwt.	£
1945[1]	0	0	1,346	6,462
1946[1]	1	2	1,487	7,455
1947[1]	2	5	2,335	17,140
1948[1]	222	768	3,731	44,466
1949	3,777	11,238	6,388	85,061
1950	2,870	8,636	11,814	199,930
1951	7,957	35,952	16,407	370,199
1952	16,186	81,014	17,505	480,806
1953	36,391	197,809	22,563	695,063
1954	56,928	343,948	33,037	982,257
1955	64,920	433,339	31,079	953,631
1956	67,176	515,023	43,856	1,175,311
1957	53,400	439,388	38,981	1,345,980
1958	44,454	388,176	23,301	811,195
1959	32,873	275,655	21,200	739,547
1960	31,232	292,121	25,210	883,570
1961	27,358	285,615	18,773	753,609

	Bluff - Stewart Is.		Exports of Frozen Rock Lobster N.Z.	
	cwt	value £	cwt.	£
1962	30,941	374,463	26,805	1,140,050
1963	34,303	399,458	23,987	1,011,297
1964	32,289	421,822	28,459	1,486,695
1965	35,405	631,744	28,042	1,959,520
1966	33,958	592,447	34,845	2,287,159
1967[2]	12,873	$132,907	48,298	$6,261,655
1968	24,259	$1,379,865	62,759	$12,728,750
1969	23,401	$1,503,766	58,131	$14,235,376

1. Prior to 1949: Bluff only.

2. Note: Change to Decimal currency, (1967 onwards).

(Source: Marine Department).

A slight drop in exports occurred in 1955, but this was due to the unavailability of suitable shipping and full local freezers. The following year the upward trend continued, showing the value of rock lobster exports to exceed one million pounds for the first time. 1956 was also the peak year of production for Bluff vessels, reaching 67,176 cwt.

This boom could not last however, as the large numbers of boats operating quickly removed the accumulated mature stock. Bluff landings fell by 15,635 cwt. in 1957, and in the following year catches from the tailing-at-sea area fell by a further 16,717 cwt. This is a normal consequence as previously unfished accumulated stocks are reduced, and a balance is achieved between the natural growth rate of the stocks and the fishing

effort applied.

The growth of rock lobster fishing, partly due to the diversion of boats from wet-fishing to catching rock lobsters, had a very disturbing impact on the fishing industry generally. The lucrative trade in rock lobster tails, and the high earnings of the rock lobster boats, caused high prices to be paid for boats, which, in turn, had an effect on boat prices throughout the country. Many of the major trawling units in Dunedin, Westport and Greymouth transferred operations entirely to rock lobster fishing, and in Bluff every boat that was capable of doing so was engaged in fishing for rock lobsters in the West Coast Sounds area. This presented a problem for the Licensing Authority. If these boats were to revert to wet-fishing it was feared that there would be too many boats. At the same time the refusal to grant licenses was keeping others out of the industry. The effect of the export trade on local rock lobster supplies also presented a real problem. The price to the fisherman was the same whether the product was destined for export or for the local market, and the local price was raised accordingly. This resulted in a decided drop in New Zealand consumption, brought about by consumer resistance.

Following the peak fishing year of 1956, southern rock lobstermen found that not only were they faced with diminished returns, but they had to fish longer hours and closer inshore, and extend their trips over longer periods than was the case previously. It was significant, too, that the average size of rock lobsters being taken was considerably smaller than

when the fishery was being developed, a fact evidenced by the tail gradings at export.

At this stage an account of the course of events of an overseas fishery is in order. To this end, a quotation is presented from the work of R.S. Wimpenny on the North Sea plaice fishery:-

> "The changes in the population of plaice..... all run to a common pattern. First a virgin fishery is found and in the early stages of exploitation a few fishing vessels find a very great abundance of fish and the catches per unit of effort are exceedingly high. Other vessels flock to this Eldorado and the yield from the ground rises. The larger number of vessels, however, do not do as well individually as the pioneers.
>
> "The next stage is characterised by a substantial falling off in the catch per unit effort although the number of vessels working and the total catch continues to increase. At this stage it is clear to all the fishermen that things are not as good as they used to be. Nevertheless, the young and enterprising among the skippers by adapting and modifying their gear, or by reaching out into unexploited corners of the fishing area, are still able to do well enough to attract others to follow them and the total yield from the area may continue to rise. Finally, there comes a condition in which, in spite

> of the widespread application of the new devices and adaptations, there is no corresponding rise in the total yield and it may even begin to fall. At this juncture the catch per unit of time of the old-fashioned vessels fishing with their original type of equipment will have fallen below that level which is the economic minimum for their operation, while even for the most efficient craft this level is being approached". (Wimpenny, R.S. 1953. pp.88-89).

It appears that a similar situation occurred in the Bluff fishing area. Firstly, the discovery of the field began in 1948 and 1949,when production increased over sixteen-fold and the number of boats engaged in rock lobstering rose from none in 1947 to forty in 1949. For the next eight years the number of boats rose from 40 to 103, and enjoyed another huge increase in production, including the 1956 peak of 67,176 cwt. Despite falling catches after 1956, vessel numbers continued to increase up until 1965,when over 150 boats were actually catching less than the amount caught by 75 boats in 1953. Thus, it seemed that the border between economic and uneconomic operations was rapidly being reached, and it had become necessary to find new sources of supply or income.

However, since fishing is as much a way of life as means of earning a living, some fishermen prefer to continue in their occupation, even if the cash returns are meagre, rather than transfer to alternative employment. The degree of freedom and sense of independence enjoyed in this open-air life

often seems to compensate for a poor monetary reward. Hence, although cash rewards for Bluff rock lobstermen were certainly not meagre, faced with falling returns and high capital investment in vessels and gear, it was a natural reaction for them to seek new rock lobster fishing fields. Admittedly, many boats operating in the Fiordland area had previously been trawlers and could revert to wet fishing, but with a lower return for effort. On the other hand, many boats had been built specially for rock lobster fishing, and were unsuitable for trawling without substantial modification at great expense. Consequently, the most enterprising and experienced fishermen looked for rewarding new rock lobster grounds where their boats, gear and methods of operation would not need to be greatly changed. They turned to the Chatham Islands which, although recorded as a rich rock lobstering ground by the "Nora Niven" in 1907, was rediscovered in the later months of 1965.

Beginnings of Rock Lobstering at the Chatham Islands

Some Chatham Islanders talk of their islands in terms of either "before crayfishing", - "B.C.", - or afterwards, so rapid and clear-cut were many of the changes in economic activity.

After a drop in production during World War II, the blue cod fishery which had helped sustain the islands during the Depression in the 1930's, showed some recovery in production and financial returns, but the number of boats fishing full-time remained fairly static, from three to nine boats during the period 1948 - 1965. Improvements in landings and prices

earned were partly a result of improved shore facilities. For the Chatham Islanders, however, some of the greatest changes in their islands' history were yet to come.

In 1958, only two years after the peak of landings in the Bluff - Stewart Island area, a Bluff-based rock-lobster boat, the "Chance", prospected at the Chathams for rock lobsters. Although a very enterprising move, the expedition was unsuccessful,and the "Chance" returned home with few fish and much of its gear lost.

The 1962 Select Committee on Fishing recommended "that an adequate survey be made of the Chatham Islands fishing grounds and stocks, including crayfish, as soon as possible". Another interesting recommendation of the 1962 Select Committee, and one to be dealt with more specifically in later pages, was "that the effect on the economy of the Chatham Islands should be a prime consideration in any proposal to develop or expand the fisheries there". (A.J.H.R. I.19. 1962).

In 1965 most fishing in the Chathams was still based on blue cod and groper. Although seven licences for catching rock lobsters were held by Chatham Islands - registered fishing vessels, as early as 1958, initially encouraged, and then discouraged by the unsuccessful voyage of the "Chance", this number had declined to one by 1965. Local fishermen had no skills or experience in catching rock lobsters, and though they apparently did try during 1958 - 1965, they had not succeeded. Their lack of success seems strange when it was known since the voyage of the "Nora Niven" in 1907, that massive stocks of rock

lobsters were present in the area. Through 1965, the only fish processing carried out was on the blue cod and groper catch at the islands' cooperative freezer at Owenga. As mentioned above, although shore facilities had been improved, inadequate shipping and cold storage space still kept the output relatively small.

In October 1965, however, two boats discovered by mistake what the luckless "Chance" had been searching for. The popular, perhaps apochryphal, story has it that the two boats, while fleeing for shelter in a storm, dropped pots and returned later to find them loaded with giant rock lobsters.

In January, 1966, the "Miro", a Bluff-based oyster dredger which had previously fished in the Chathams waters for cod, sailed to the Chatham Islands and returned with a catch of rock lobsters which aroused great interest.

> "Crayfish, the like of which have not been seen in southern waters for many years, were unloaded from the vessel "Miro" at Bluff after a 3-week catching spree in the Chatham Islands..... "Miro" returned from the Chathams in early February with its 25-ton capacity freezer filled to the brim with giant crays..... "Miro"'s amazing catch sparked off interest among Bluff fishermen and has possibly started a race to the area by other boats". (Commercial Fishing, Vol. 4 No. 8, 1966).

The trip was the result of an approach made about three years previously by some of the islanders who had asked the

skipper of the "Miro" to the islands to investigate the rock-lobster catching and fishing possibilities in the area. So successful was the trip that almost immediately the "Miro" returned, four Bluff vessels headed for the Chathams. By February, 1966, the rush to the Chatham Islands rock lobster grounds was under way.

As expected, vessels equipped for rock-lobster fishing and manned by experienced fishermen, were the first vessels to move to the area. That Bluff fishermen took the lead in the venture to the Chathams is obvious from the number of boats from Bluff which re-registered at the Chathams from 1966 - 1969. (See Table 4.2.).

The large, well-found vessels of the Bluff-Stewart Island fleet, equipped with adequate crew accommodation, freezers and the right sort of gear, were obviously suited to work the Chathams grounds. Southern skippers, through enterprise and experience, had developed squat, rectangular pots of varying sizes and construction. A pot approximately 5' x 3' x 18" was fairly common. Some frames were made of round, mild, structural steel, others of angle iron, each covered with wire mesh. These pots had proved durable and efficient, and although they required winches and derricks for hoisting, were soon copied by other newcomers and local fishermen at the Chatham Islands. North Island fishermen soon adopted them in preference to their old-fashioned, circular supplejack creels. (Plate 4.1).

PLATE 4.1. Common type of rock lobster pot in use at Chatham Islands, 1970. Pot constructed of steel rod and covered with wire mesh. Note the blue cod used for bait.

Efficient equipment and experienced, practical fishermen, operating on virgin grounds, soon produced large hauls. However, development during the first few months of the fishery was extremely haphazard. The biological resource had been discovered. Exploratory surveys and test fishing had proved the fishery to be economically viable. What remained to be achieved was the build-up of the secondary and tertiary facilities of processing and servicing.

Table 4.2. Vessels Re-Registered at Chatham Islands from N.Z. Mainland Fishing Ports. 1966-1969[1].

Original Port of Registry	1966	1967	1968	1969
Bluff	14	13	15	10
Dunedin	3	5	10	6
Timaru		7	3	2
Lyttelton	5	3	5	3
Greymouth			1	2
Nelson			1	2
Wellington	3	2	2	2
Wanganui			1	
New Plymouth				1
Napier			1	1
Gisborne			1	4
Auckland			1	
Northland			1	2
Russell	1			
Total	26	30	42	35

1. These figures are incomplete since not all changes of registry recorded. Trends are clear, however.
Source: Marine Dept. (unpublished) records.

CHAPTER FIVE

The Chatham Islands Rock Lobster Industry

General

In the early years of the growth of a fishery, economic factors may inhibit or promote progress just as much as biological factors, possibly even more. Of major importance is the basic requirement of sufficient demand and outlets for the increased production. Based on the premise that all fisheries show the same historical pattern of development, it is possible to define phases of development in general terms. Initially, rapid growth takes place. This is followed by a period of steady development. At a subsequent time the fishery may stabilise at a level of extraction dependent upon the availability of the resource, the demand, and the catching effort applied. From this stage, further development may occur, or, a decline may set in, which, if taken to its ultimate conclusion, may cause the suspension of all fishing, at which time the fishery is labelled "extinguished".

"Examples of fisheries in these phases in New Zealand are:

1. nascent: trawl fisheries at the turn of the century; pelagic fisheries today.
2. developing: trawl fisheries 1908-1927, 1963 to date; Chatham Islands rock lobster industry to date.
3. stabilized: trawl fisheries 1927-1962; mainland rock lobstering today.
4. declining: humpback whale fishery 1955-1965; Tasman Bay scallops 1965-1968.

5. extinguished: humpback whale fishery after 1965 when the last station closed". - (Slack, E.B. (ed.); 1969; p. 32).

Slack's inclusion of the Chathams rock lobster industry in the "developing" stage is presently open to doubt due to the rapid changes in the fishery since 1968. (This will be discussed later).

Before he enters a new fishery, the average commercial operator requires information on likely catches and probable volume of production from the nascent fishery. Rock lobstermen look for fish by using scouting pots or trawls on likely looking areas of the sea bed. These trials will directly establish the quantity which a fishing unit can expect to land after a certain unit of time. An estimate can then be made of the possible catch, and of the number of fishing units that would be required efficiently to take the catch.

The situation most likely to arise is that one of the fishing team, more enterprising than the rest, will initiate the fishery; if he is successful enough to earn satisfactory monetary rewards, additional fishing teams are likely to enter the fishery. This, following on from Wimpenny's remarks on the plaice industry, (Wimpenny, 1953, p.89) appears to be what happened in the case of the Chatham Islands. The similarity between the Bluff rock lobster area and the Chatham Islands will become clear in subsequent pages.

The catches made by the first boats, will, from the biological point of view, represent a virtually unfished population. As more boats enter the fishery, providing a greater concentrat-

ion of fishing effort, the fish population structure changes. Under natural conditions, without disturbance from fishing, the fish stock attains a degree of equilibrium with its environment. This equilibrium may be cyclical. A population characterised by small fish may develop into one characterised by larger fish, due to a reduction in mortality, an increase in food supplies, a decrease in predators, a change in sea state conditions, or any combination of these factors. In other words, although in equilibrium with the environment, the fish stock "may fluctuate in abundance from year to year in response to normal fluctuations of environmental components". (Slack, E.B. ed. 1969. p.34). In the stable, unfished condition, there is usually a large proportion of older, larger fish. Consequently, the first major impact of fishing is to reduce the proportion of older fish and increase the proportion of the younger. This is not necessarily detrimental to the fishery, since the older fish consume larger amounts of food for less weight gain than do the smaller fish. More food becomes available to younger growing fish, resulting in a larger weight gain for the total population.

Seasonal Changes in General Fishing Practice

The rock lobster is an omnivorous, nocturnal feeder, sheltering during daylight, and reputedly during periods of strong moonlight, amongst the crevices and caves of reefs and ledges. Normally they move about in the hours of darkness, feeding in close proximity to shelter, the directions and extent of their wanderings controlled, to a large degree, by the characteristics of reef topography and the incidence of food

providing organisms. With the exception of the limited migrations referred to in Chapter Three, the bottom living phase of a rock lobster is relatively sedentary, dispersion and general redistribution of the population taking place during the larval stage.

Populations of rock lobsters inhabit reef systems of varying degrees of complexity and exposure to heavy seas. Consequently, all stocks are not equally accessible, and are thus at different levels of exploitation.

General fishing practice is either to set baited pots in lines or clusters, each individually buoyed, around and among reef outcrops and heavy marine growth, or, when a rock ledge has been located, along this at the foot, or at the top, as experience dictates. The widespread use of echo-sounders enables such setting to be carried out with considerable precision.

At the Chatham Islands, during January and February, mature female crayfish in an early pre-moult condition, as well as new shell large males, are trapped in pots in large numbers. In these months mature females are generally found on heavy foul ground, while the males are generally found on lighter-rough or sand in deeper water. The catch of females begins to decline in March as feeding ceases prior to the moulting period. The meat is pink, or light brown, in colour when the fish are in this pre-moult condition. Female rock lobsters mainly moult during April, and mating and egg-carrying begins soon afterwards. Catches of large male rock lobsters are at

a low ebb during April and May. July and August are the two peak months for catches of large males. From early December, catches of large males decrease progressively as feeding ceases with the approach of moulting. During October and November catches are comprised mainly of female rock lobsters who have shed their eggs. New shellmales, and females, are taken from December onwards. (Note that the moulting cycle for Chatham Islands rock lobsters differs only slightly from those on the mainland shown on Table 3.3).

To take advantage of the limited migrations associated with the moulting cycle, fishermen are inclined to set their pots seaward of the coastal reef systems when the fish are moving from an inshore to an offshore position, and follow the migration to the deeper water. As migrations in inshore directions occur, the general aim of the operator is to continually place the pots between the rock lobsters and their destination. The approximate timing of movements is generally known for long-fished reefs from accumulated fishing experience; in the case of newly exploited grounds, small numbers of scouting pots are set to detect changes in behaviour.

Bait

Pots are baited with fresh fish, frozen fish, fish heads, fish frames (i.e. skeletal frame and head and tail after filleting). The most common types of fish bait used and their method of capture are set out in the table below. (Table 5.1.)

Table 5.1. Types of bait and methods of capture.

Type of Bait	Method of Capture
blue cod	hand lines cod pots
hapuku	hand lines
butterfish	set nets
parrot fish	" "
moki	" "
tarakihi	" " trawling
shark	hand lines set nets
conger eel	trapped in pots while preying on trapped rock lobsters or bait.

Other types of bait used include pauas, sheep and cattle hocks (rare), and even canned pet food, with the cans punctured so as to allow the contents to gradually seep out, (also rare).

There are relatively few periods when fresh bait is scarce in the Chathams, although in December and January bait is harder to find. This may be compared with the Western Australian crayfishery where the bait supply organisation is an extremely important part of the fishing operations, since there is no sizeable wet fishing industry in that area. Fishermen in Western Australia have to buy bait at fairly high prices:

"salmon heads (Kahawai) - $16 per 60 lb. bag = 10c. each.

sheep heads - $3.75 per bag; 2½ doz. per bag.

cattle hocks - $7.00 per bag; 2 doz. per bag".
- (Campbell, J.S.1967, p.24).

Chatham Islands fishermen, therefore, are fortunate to have such an abundant wet fishery so readily available, although they often complain about the time and effort involved in catching sufficient bait, especially during the mid-summer months. Fresh fish is favoured as presenting the most attractive bait. Plenty of bait, three to four fish per pot, is used. In terms of total quantity of bait used per day, the figures are very high. Assuming 150 boats, each lifting an average of 45 pots, the total weight of bait used per day would be in the vicinity of 27,000 - 37,000 lbs.

Although it is possible that pots act as shelters in a minor degree, and that rock lobsters already trapped serve to attract others, it is reasonable to assume that the soluble fractions from the bait, either diffused in the regions of the pot, or carried directionally by local currents, are the chief attractants to fish. For the pot to catch well it must be so baited and situated as to compete effectively against the attraction of natural foods on the bottom. In fishing practice, it is common to set pots in groups or closely spaced lines, so that each tends to add to the attracting powers of its companions. Small areas expected to contain rock lobsters are generally surrounded with pots so that some in a cluster or line will serve to attract rock lobsters, irrespective of the directions of local bottom currents. It is not expected that all pots will catch equally well in a given time, but that some one, or several of the group, will be in a position to intercept fish feeding in the area.

PLATE 5.1. Rock lobster pot resting on inclined frame while operator removes fastening wires on hinged door prior to tipping fish on to deck.

PLATE 5.2. Deck scene on "San Marie". Pot (as in Plate 5.1.) has been emptied and is about to be re-set. Note blue cod and groper (in box) to be used for bait.

Pot Hauling and Number of Pots Used

In use, pots are hauled daily, weather permitting. In areas of strong tide rips, very common around the Chathams, it is often impossible to lift pots other than at periods of slack tide, since floats are often dragged under during peak ebb and flow periods. Kensler states that "pots can be lifted only for about one and a half hours before and one and a half hours after slack water". (Kensler, 1969, p.507).

When pots are hauled, they are emptied of fish through a hinged door at one end of the pot. (Plate 5.1.) They are then re-baited and minor repairs are made to hauling ropes, buoy ropes and the pots themselves. After these tasks have been completed the pots are re-set. (Plate 5.2.) Pots not catching well are moved to likelier sites. Because these operations are carried out in the daylight hours, when the rock lobsters are not actively feeding, the period of absence of the pot from the sea bottom does not represent an interruption of the catching process.

In areas close to anchorages, and in the shallow waters around the coast, fishermen aim at lifting their pots every day if possible. On the deep-sea and more distant fishing grounds, pots may be lifted daily but the vessel does not land fish every day; i.e. the intervening night being spent anchored in the nearest shelter to the grounds being worked. In areas that are both one and two-day trips, the practice appears to be growing of setting more pots than can be handled efficiently

in one hauling period. In these cases, one half of the gear is pulled on one day, the other on the next; because of bad weather some pots are hauled at much longer intervals. Catches so obtained are satisfactory to fishermen, but the risk of loss of pots through chafing of buoy ropes is considerable, as is the risk of loss of fish from damaged pots and the undisturbed invasion of predators, particularly octopuses and conger eels.

Because the processes of lifting, emptying and sorting of the catch, pot-mending and re-baiting are time-consuming, and because the period of time during which these processes can be carried out is limited by weather, and sea and tide conditions, and by the time occupied in travelling to and from anchorages and fishing grounds, it follows that, in a given area and type of vessel, a fisherman can manage efficiently only a certain number of pots. Fishermen are aware of this, but many tend to operate pots in excess of the most efficient number, partly (as detailed above) to ensure that some of a set will be in a position to catch well, partly to detect local rock lobster migrations, partly, (though usually strongly denied), to pre-empt areas within which to set the main runs of pots, and partly for reasons of prestige. Generally, a lower number of pots, about 40 - 60, hauled at daily intervals, is used on higher yielding grounds. A higher number, even over 200 for the larger boats over 100 ft., are hauled less frequently on lower yielding grounds.

Hydrology of the Chathams Region

The broad pattern of the circulation off the east coast of

the South Island has been described by Deacon (1937) and related to the general pattern of southern oceanic circulation. The current systems influencing the Chatham Islands have been described by Garner (1957, 1961), Burling (1961) and Garner and Ridgeway (1965). In the South Tasman Sea the sub-antarctic surface water of the West Wind Drift meets the sub-tropical East Australian Current and gives rise to a belt of mixed water near southern New Zealand. Here the current divides, part flowing north along the west coast of the South Island, the rest around the southern end of the South Island and north-east towards the Chathams. The northern boundary of this latter branch impinges on a tongue of warm sub-tropical water passing southwards from East Cape. Where the two water masses meet there is an area of intermingling, the sub-tropical convergence.

The Chatham Islands lie near this zone of convergence and are subject to both sub-tropical and sub-antarctic influences in varying degrees. This has an important bearing on the composition of both marine and land flora and fauna which show both sub-tropical and sub-antarctic affinities.

Climate of the Chathams Region

The most complete appraisal of the Chatham Islands climate is given in an unpublished pamphlet of the New Zealand Meteorological Office (1947). In this report the climate is effectively summed up as "windy, damp and cool". South-west winds predominate (frequency 30 per cent), and sometimes blow for more than a week at a time, reaching gale force on an average of 17 days in a year. Skies are frequently overcast, the

average amount of cloud is eight-tenths and clear days occur only 65 days a year on an average. The mean rainfall usually ranges between 20 - 40 inches with an average of 33.6 inches recorded at Waitangi. Raindays (over 0.01 inches per day) average more than 180 days per year. Air temperatures have a mean annual value of 51.6 degrees Fahrenheit, the July average being 45.4 degrees F., and the January average being 57.6 degrees F. The mean range is 10.4 degrees F. which is almost the same as the mean annual range. The highest and lowest air temperatures ever recorded are 76 degrees F. and 28 degrees F. respectively.

Availability of Shelter

Exposure to all winds and unlimited length of fetch means that Chathams waters have generally heavy sea conditions. Unlike the Fiordland area, where rock lobster boats can find many good anchorages, the Chathams have very little shelter.

Port Hutt is the best anchorage in the Chathams, giving shelter in all winds except south-easterlies. Fortunately winds from this direction only blow about seven per cent of the time and vessels can easily shift to a lee shore off Waitangi. Room at Port Hutt is limited however. Kaingaroa has a fair anchorage in all weather. At Owenga about 18 boats of less than 40 - 45 ft. can be moored inside the reef, the entrance through which is only one to one and a half chains wide and the depth only two fathoms. (Plate 5.3). In easterly weather heavy seas may break right into the anchorage. Boats can anchor inshore off Owenga in westerly and south-westerly

PLATE 5.3. Fishing vessels on permanent moorings inside the reef at Owenga. The entrance through the reef is to the left of the photo. South-west wind blowing offshore, hence the calm lee-shore conditions.

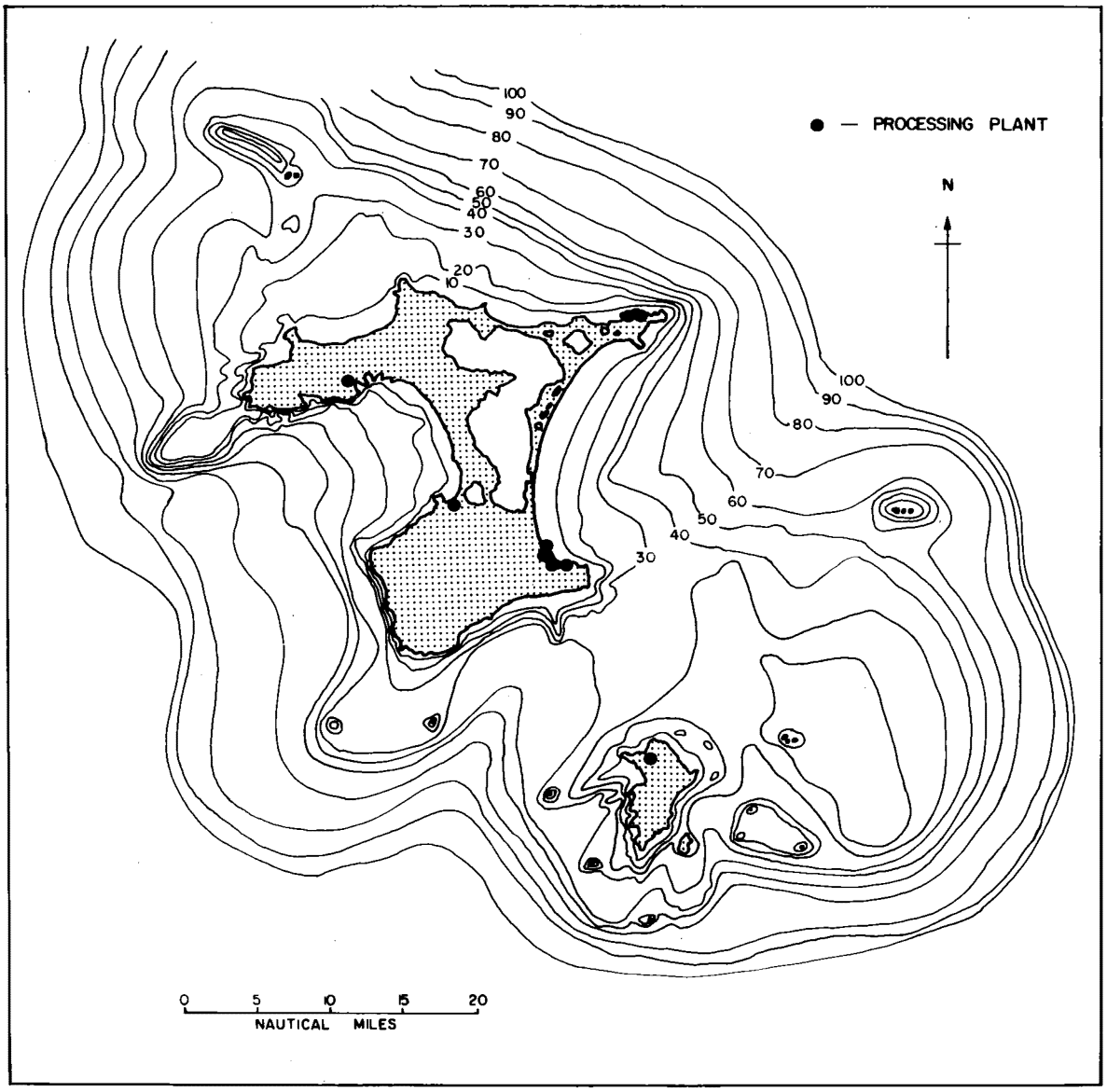
weather. The anchorage at Waitangi is unsafe in westerly and north-westerly gales when breaking seas roll in. Even in moderate to fresh winds between the north-west and south-west the swell at the wharf makes it difficult or impossible for a boat to lie alongside.

Pitt Island offers more alternative anchorages than most parts of the Chathams of similar area. In south-west weather, the only two anchorages are off Flower Pot and close inshore north-west of Kahuitara, although neither are safe in big seas. Waipaua gives shelter in weather between north and east, and Canister Cove in winds between north-east and west. On the west coast, Waihere Bay provides anchorage in northerly and easterly weather.

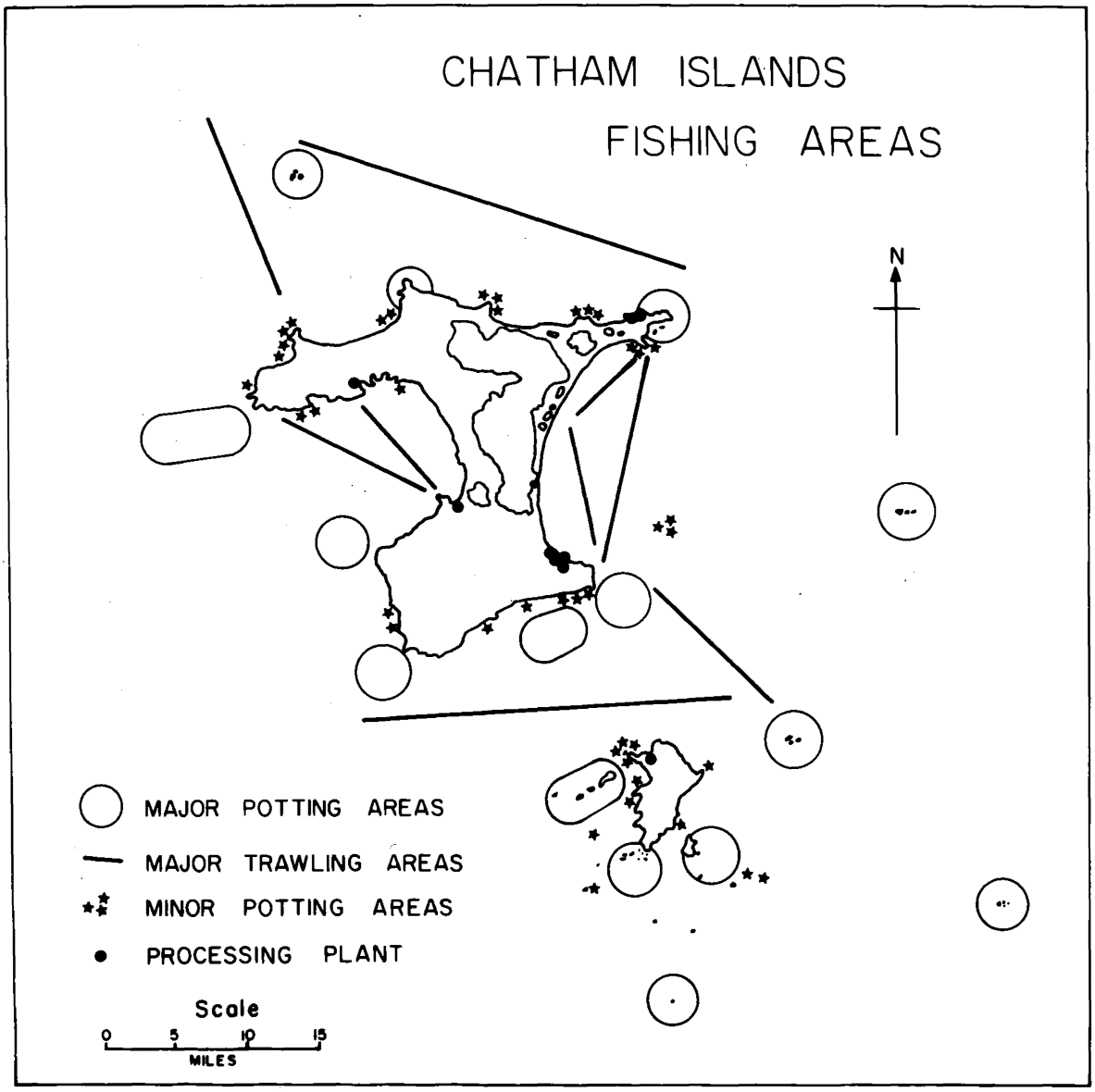
Consequently, all vessels without permanent moorings must steam from anchorage to anchorage as the weather changes. This is expensive and unproductive. Charts of the islands are rather out-of-date and lack detail of underwater obstacles and rocks, especially in areas close to shore, the area in which many pots are set.

Diffusion of Fishing around the Chatham Islands coast

The first fishing effort appears to have taken place in the Owenga area, probably because of the existence there of the Chatham Islands fishermen's cooperative freezer. Mainland fishermen were helped by the local knowledge of the Chatham Islands fishermen, although only one of the three local Owenga vessels was engaged in rock lobster catching in June, 1966. Up to this time the major areas being worked were Pitt Island



MAP 5.1. Offshore topography and processing plant locations, Chatham Islands, 1.1.70. (Contour Interval: ten fathoms).



MAP 5.2. Chatham Islands: Rock lobster catching areas and factory locations (1.1.70).

where catches were good and alternative anchorages close together. Through 1966, vessels extended their activities to Manukau Reef, to the area between Cape L'Eveque and Durham Point, and along the north side of Petre Bay as far out as Western Reef. By 1967, potting was being carried out in Hanson Bay south of Owenga, Western Reef, Cuba Channel, The Horns and around Pitt Island. Operations had also extended to Kaingaroa and Okawa and along the north coast between Taupeka and Point Munning. The activities of the fishing vessels had, by March, 1968, extended right around the Chatham Island coast and Pitt Island. Vessels also fished areas at The Sisters, Star Keys, South East Island, Eastern Reef and the Pyramid.

From beginnings in 1965, therefore, it was only two and a half years before fishing had extended from the source area near Owenga, right around the main islands and out to the offshore islets. From Owenga the initial move was to Pitt and Manukau. Then vessels based at Waitangi and Port Hutt enlarged their operations around Petre Bay and along the north coast towards Cape Young which was the last major Chatham Island area to be fished. There they met the vessels from Kaingaroa and boats from all ports began to reach out more regularly in search of new grounds on the reefs, rocks and islets up to 20 and 30 miles offshore. (See maps 5.1. and 5.2.).

Production

Table 5.2. shows the trends in production of the industry since 1965. Monthly landings show a close relationship to the rock lobster breeding and moulting cycle.

Table 5.2. Monthly Landings of Rock Lobster at Chatham Islands 1965-9 (cwt.).

Month	1965	1966	1967	1968	1969
Jan.	0	44	6,507	12,177	13,806
Feb.	10	861	8,060	16,779	18,811
Mar.	1	2,282	3,037	8,305	4,850
Apr.	0	254	629	166	610
May	0	574.	1,165	1,453	1,565
June	0	1,268	7,227	8,451	4,879
July	0	2,787	7,011	13,734	7,819
Aug.	0	3,546	9,322	18,324	5,464
Sept.	0	1,469	6,639	6,051	3,202
Oct.	0	2,424	1,541	7,799	3,007
Nov.	22	5,603	8,444	14,668	9,264
Dec.	6	3,854	5,498	9,125	8,174
Total	39	24,965	65,080	117,032	81,451

Source: A.J.H.R. H.15., 1965-1969.

The figures in Table 5.2. before 1968 do not show all rock lobsters caught in the Chatham Islands. They show landings at the Chathams and therefore do not take account of fish caught in the Chatham Islands and landed elsewhere on the mainland. Initially, quite significant quantities were involved, but this quantity has diminished gradually until presently virtually all fish caught at the Chathams are landed there. The large quantities caught in 1966 and 1967 far outstripped the capacity of secondary (processing) facilities on the islands. The "Miro" froze her catch whole and shipped them back to New Zealand for

processing. The only alternative to such action was to tail the lobsters at sea and "rough" pack the tails as was done in the Fiordland area. However, this was illegal and the fishermen risked penalty. As well as being a costly and dangerous undertaking for fishing vessels to ship their own catches back to New Zealand, quality standards were jeopardised because many vessels had inadequate freezers. Loss of fishing time meant loss of money.

However, fishing time was also lost if vessels wished to put their catches into the fishermen's cooperative at Owenga. This one plant was nowhere near capable of handling the catches being landed by mid-1966. Several boats were put off because of this, and, worse still, in perfect fishing weather of which the islands seldom receive their share. This situation created a most unsatisfactory atmosphere between the cooperative and the boats put off. In addition to the boats being put off, others were arriving from New Zealand to find nowhere to discharge their catch for processing ashore. The processing plant at Owenga had no problem in accommodating the already frozen 50 lb. boxes, the store-room being quite adequate. The bottleneck was in the processing and initial freezing stages.

In response to these problems, shore factories were established. This marked a new phase as the secondary facilities of the industry, processing and packing plants were set up. Gradually, the factories developed a more general, or service role, providing pots, ropes, wire mesh, fuel, food supplies and washing and showering facilities. In other words, a level of vertical in-

tegration of activities was extended to the Chathams rock lobster industry for the first time.

Early in 1966 the former Blenheim scow "Echo" left for the Chathams and was followed by the "Willomee" (313 tons) which was sent by a Bluff-based company to act as a mother-ship, particularly for vessels operating around Pitt Island. The "Willomee" had large freezers and operated as a fish carrier to New Zealand.

However, attempts to set up factory ships were soon precluded by regulations passed in order to enable the no tailing-at-sea restriction to be policed, to help improve quality and to enable the Chatham Islands County Council to obtain revenue from fish exported from the islands.

The first development in shore-based factories was the acquisition of the fishermen's cooperative by a mainland firm based at Hikurangi, Northland, which immediately spent $20,000 on improving processing facilities to increase throughput, and doubled the freezer storage space. By 1969 nine factories had been established: four in 1966 (at Owenga, Port Hutt, Kaingaroa and Waitangi); three in 1967 (Owenga, Kaingaroa and Flower Pot); and two in 1968 (both at Owenga). These processing plants clearly showed the rapid development of the industry and the large amounts of capital investment both on the land and in the water, for the factories grew in response to the greatly increased number of boats and production.

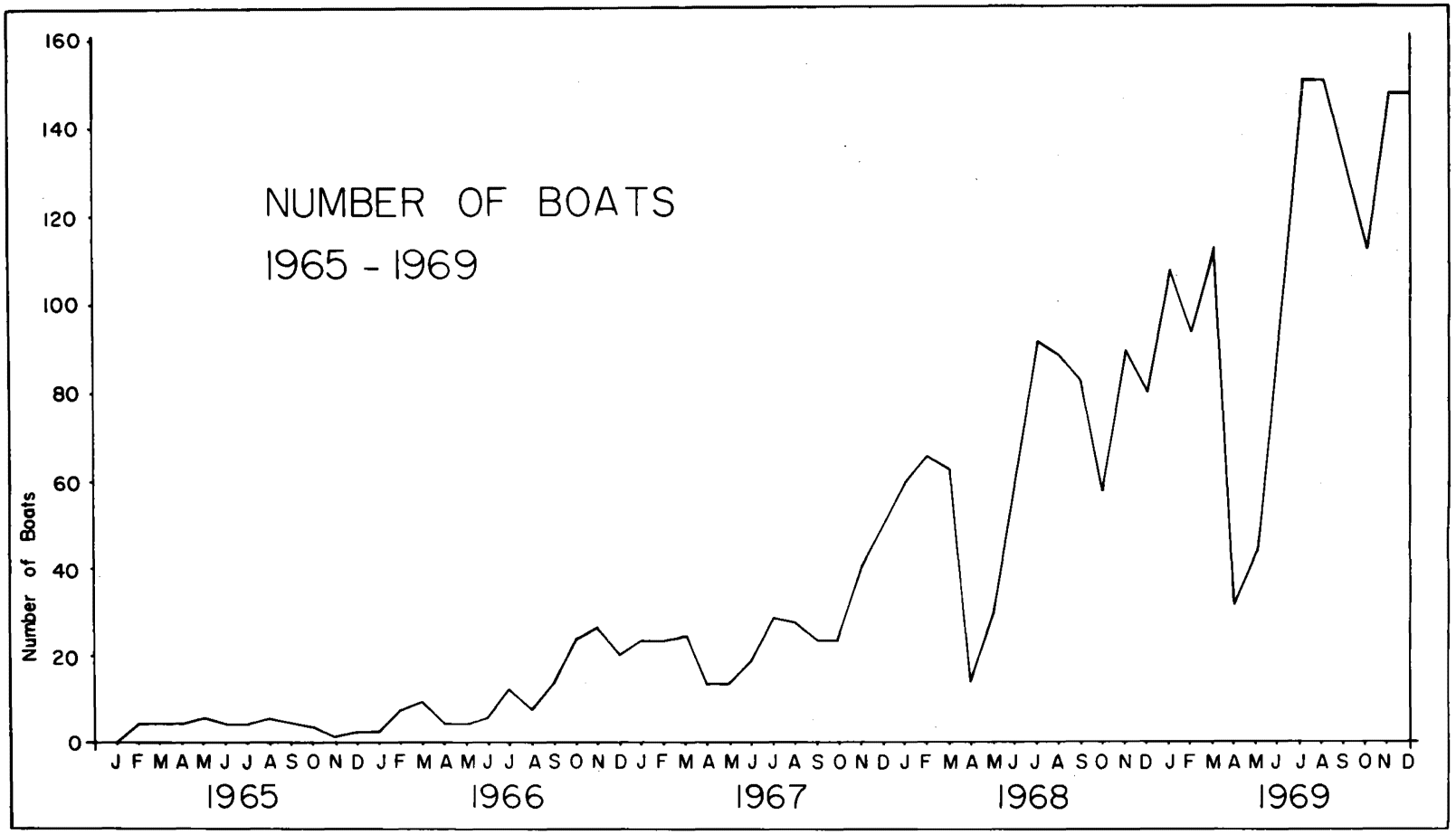
As mentioned, in June, 1966, only one factory was in operation. Fish were landed by dinghy at Owenga, or over

the wharf at Waitangi and transported through to Owenga by truck. This meant that, after processing, the fish eventually had to be transported back to Waitangi for shipment. Most factories established in 1966 and 1967, initially "rough" packed the tails in polythene lined 50 lb. cartons. These were later thawed and repacked into export containers at factories on the mainland. By late 1968, however, all companies were producing export packs of set weight, and number and size of tail. This avoided the need to thaw tails for repacking, and allowed for better quality.

The Chatham Islands Fishing Fleet

As the number of factories increased, so competition between them developed. Many companies bought or built vessels specially in order to ensure continuity and volume of supply. Company boats were leased to skippers on varying terms. Crew shares also varied depending on the distribution of costs between skipper, crew and company. Owner-operators attached themselves to a particular company depending on where they wished to fish. Except for company-owned boats, few firm contracts for supply are entered into; although some private owners are "tied" to particular companies which may have advanced them money for gear and equipment at the start of the season.

Graph 5.1. shows the number of vessels registered at the Chatham Islands, 1965 - 1969, which actually made landings of rock lobsters. It is interesting to note that although over 230 boats were registered in 1969, a maximum of 150 of them were actually fishing at one time. (Marine Dept. Records,



GRAPH 5.1. Number of fishing vessels, registered at the Chatham Islands, which made landings of rock lobsters, each month, 1965-1969. (Source: Marine Dept. (unpublished) Records).

unpublished). The reasons for this are numerous. At any particular time there are many boats under repair, survey and refit, both in the Chathams and New Zealand, which are effectively lost to the fleet during the period of overhaul. The number of vessels registered also includes boats often not even built, their owners registering them at the Chathams in case restrictions were placed on the number of boats allowed to operate in the area. For example, in 1969, 71 vessels were listed as "new registrations" (i.e. brand new boats or vessels converted to fishing). However, 14 of these so-called "new registrations" never fished in the area. In 1968 there were 11 "new registrations", one of which never fished at the islands. These figures further exemplify the massive capital investment in vessels. It must also be remembered that each boat requires about $2,000 worth of fishing gear as well (40 fully-equipped pots each costing approximately $50.00).

One effect of the rush to the Chathams was that mainland boat-builders enjoyed brisk business, and most yards always had at least one vessel on the blocks destined for the Chatham Islands. The vessels built had to be well-found and sturdy, for in the heavy weather and sea conditions around the Chathams the casualty rate among vessels and crews has been very high. As well as those completely lost, many suffer damage that keeps them from fishing for varying periods.

Replacement costs for vessels wrecked were very high. Approximate figures only may be given for vessels, but wide

differences in fitting out occur. One firm supplied the following steel vessels for rock lobster fishing in the Chathams, 1966 - 1969.

6 x 29 ft.	4 cyl. diesel	5½ tons	$10,000 each
10 x 34 ft.	6 " "	7 tons	$14,500 "
1 x 36 ft.		11 tons	$20,000 "
1 x 37 ft.	- (fitted as trawler with freezer)	18 tons	$27,000 "
2 x 43 ft.	- (fitted as trawlers with freezers)	26 tons	$38,000 "
1 x 43 ft.		24 tons	$28,000 "
1 x 54 ft.	- (fitted as trawler with freezer)	54 tons	$60,000 "

- Steel Boats (Wanganui) Ltd., Wanganui.

Most noticeable price increases occur when freezers are installed. Many Chatham Island vessels are equipped with radar and echo sounders, also very expensive items of equipment.

The size of vessels varies. The National Development Conference, Survey of the Fishing Industry, 1968, stated that approximately 45 per cent of Chatham Island registered vessels were over 40 ft. Of these 55 per cent were from 41 - 50 ft. Most Chatham Island vessels therefore are in the 30 - 50 ft. size group, although in 1967 two vessels exceeded 90 ft.

Table 5.3. shows the ownership structure and age range of the Chatham Islands fishing fleet. Many of the vessels are relatively new. While company boats made up approximately 40 per cent of vessels at the Chathams in 1967, this figure may be misleading. In many cases owner-operators form a limited

Table 5.3. Ownership structure and Age Range of boats, Chatham Islands, 1968.

No. of boats owned by individ.	Companies with 2 or less boats		Companies with 3 or more boats		TOTAL NO. BOATS	AGE RANGE YEARS					
	No. of Companies	No. of Boats	No. of Companies	No. of Boats		Un-known	Under 10 years	11-15 years	16-20 years	21-30 years	Over 30 years
31	18	20	1.	4	55	3	34	4	3	4	7

1. There are 21 companies in N.Z. which have 3 or more boats. These may be in several ports which reflects the integrated nature of their operations.

   i.e. 4 vessels in Chatham Islands belonged to some of these Companies.

   Source: N.D.C. "Survey of the Fishing Industry" - 1968.

liability company to run their own boats. This trend has continued, but the larger fishing and processing companies have increased the size of their fleets. By 1970 one Owenga company owned no less than eight vessels of a standard design, all less than two years old.

Catch Per Boat

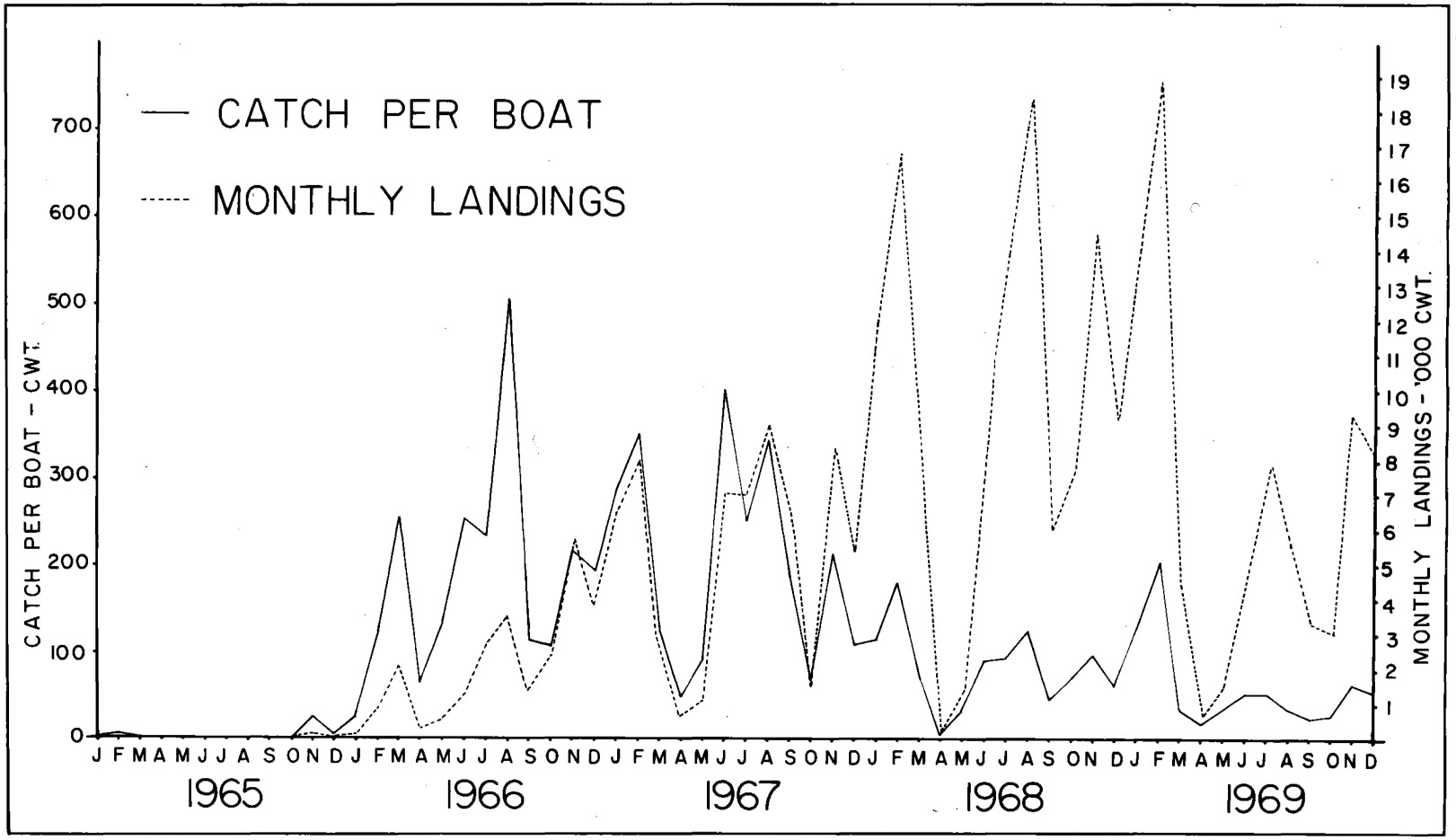
However, the number and type of vessels operating in a fishery does not reflect the true economic nature of the industry. The annual landings (Table 5.2.) show the overall productivity of a fishery, but take no account of the amount of effort expended in extraction. There is a better indicator of the abundance of fishing stocks. This is the catch per unit of effort. The effort may be the number of trawl shots, pot lifts or dredge runs. It is also possible to regard the catch per vessel as a measure of fishing intensity. A unit of effort expended when fish are plentiful will take more fish than when the stock numbers have been considerably depleted by fishing effort. In a "developing" fishery, catch per unit will show little change despite the addition of further fishing units. Total mortality shows little change and the total catch per unit will remain relatively constant. When fishing effort has increased to a stage where it is accounting for a greater part of the mortality however, the addition of further fishing units, or an increase in the efficiency of the existing ones, will progressively decrease the quantity of the fish caught per unit.

New Zealand fishermen are required to submit to the Marine

Department returns of landings of rock lobsters, but need show only the number of days fished, the landings each month and the method of fishing. There is no analysis to show the number of pots fished and the frequency with which they were lifted, or to show the number or duration of trawl sets. Fishermen's returns show individual vessel's catches and may, as such, be construed as an expression of income. For this reason, fishermen's return cards are confidential to non-Marine Department staff. However, Kensler, a Marine Department fishery scientist, has described briefly the catch, effort and catch per unit effort using Marine Department confidential data (Kensler, 1969).

In the absence of data of the detail used by Kensler, catch per unit statistics must be calculated from the known monthly catches published by the Marine Department, and the number of vessels actually fishing (Graph 5.1.). This is a catch per boat figure, which, although slightly less exact than some of Kensler's indices, does show quite clearly the effects of intensified fishing.

Graph 5.2. shows the total monthly landings of rock lobster in the Chatham Islands during 1965-1969, and the corresponding catches per boat. This data, reproduced in Table 5.4., is the most valuable available for analysing the trends in the Chatham Islands fishery.



GRAPH 5.2. Total monthly landings of rock lobster at the Chatham Islands, and monthly catch per boat, 1965-1969.

Table 5.4. Number of Boats and Catch per Boat per month:- Chatham Islands, 1965-1969.

	1965		1966		1967		1968		1969	
	No. of Boats	C.P.B. cwt.	No. of Boats	C.P.B. cwt.	No. of Boats	C.P.B. cwt.	No. of Boats	C.P.B. cwt.	No. of Boats	C.P.B. cwt.
Jan.	0	0	2	22	23	282.9	59	113.8	107	129.0
Feb.	4	2.5	7	123.0	23	350.4	65	180.4	93	202.2
Mar.	4	0.25	9	254.6	24	126.5	62	74.1	112	43.3
Apr.	4	0	4	63.5	13	48.3	14	5.3	31	19.6
May	5	0	4	143.5	13	89.6	29	33.7	43	36.4
June	4	0	5	253.6	18	401.5	60	90.8	93	52.4
July	4	0	12	232.1	28	250.3	91	91.5	150	52.1
Aug.	5	0	7	506.5	27	345.2	88	122.1	150	36.4
Sep.	4	0	13	113.0	23	288.6	82	46.5	130	24.6
Oct.	3	0	23	105.3	23	67.0	57	70.2	111	27.1
Nov.	1	22.0	26	215.5	40	211.1	89	99.7	147	63.0
Dec.	2	3.0	20	192.7	50	109.9	79	62.0	147	55.6
Average No. Boats per month	3.33		11.0		25.41		64.58		109.5	
Average catch per boat per month.		2.31		185.44		214.27		82.50		61.80

Five features from Graph 5.2. are clear:

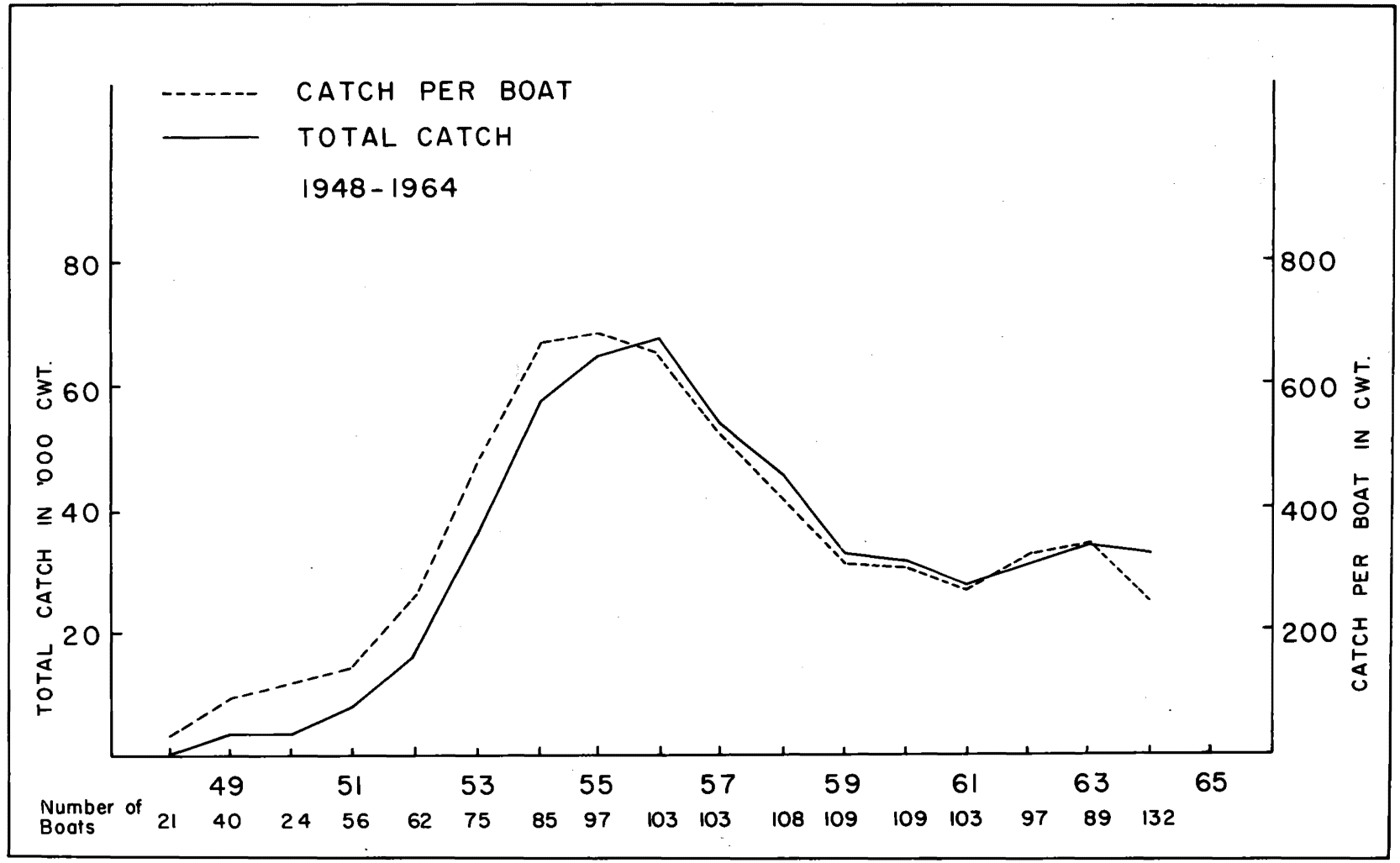
1. The very high catches per boat of the first vessels in the area.
2. From 1965 to 1968 the total catch per year kept pace with the increasing number of boats.
3. On the other hand, it was only for the first two years (October 1965 - October 1967) that the catches per boat corresponded with the increase in the number of vessels arriving in the area.
4. The rapid increase, after October 1967, in the number of vessels which resulted in an increase in the total production, but reduced the catches per boat.
5. The substantial drop in total production in the last nine months of 1969, despite the larger than ever number of boats fishing.

In terms of catch per boat, therefore, October 1967 marked a turning point in the fishery, but, overall, catch rates were still relatively very high, and certainly high enough to attract the great influx of boats which followed. Indeed, it would appear from Marine Department statistics on rock lobster permits in 1968, that 10 per cent of the permit holders (i.e. those at the Chatham Islands) were producing over 50 per cent of the national total catch of rock lobsters.

At this stage a review of the development of the rock lobster fishery in Southland is relevant to the trends observed in the Chatham Islands. Landings for Bluff and Stewart Island, from which port most of the boats fishing in Southland waters

operated, is shown in Graph 5.3.

The Southland fishery developed after 1948, but several years elapsed before boats became geared to work the area properly. Peak landings were reached in 1956 and then declined sharply after a reduction in the number of large specimens. The overall size of the rock lobsters there has declined over the years, and the fishery is becoming increasingly dependent on the growth rate of the previous year's undersized stock. Like the Chathams, the catch per boat began to decline before peak production was reached, and the number of vessels continued to rise even though the production peak was passed. The whole timespan of the development, peak, falling and stabilising of catches in the Bluff-Stewart Island area, was spread over 15 years (1948-1963). On the other hand, the peak production for the Chathams has apparently already been reached after only four years, compared with nine years at Bluff and Stewart Island. The reasons for this may lie in the heavier fishing pressure which was imposed on the Chathams from the outset of the "boom". Most boats were geared to work the area effectively as soon as they arrived. One boat in the Fiordland fishery, because of the travel time involved (i.e. in return to Bluff, Dunedin etc.), probably exerts less fishing pressure than the same boat at the Chathams, which can spend longer time on the fishing grounds because of the proximity, in relative terms, of the packing houses. In other words, it appears that the Chatham Islands rock lobster fishery, like that of Bluff-Stewart Island, follows the "normal" pattern of a newly



GRAPH 5.3. 1948-1964. Bluff-Stewart Island Rock Lobster Landings and Catch per Boat.

exploited fishery, but, because of a higher degree of fishing intensity, the "normal" trends have been concentrated into a shorter time period at the Chathams.

Also obvious from Graph 5.2. is the sharp drop in landings during the winter months of 1969. This is possibly an indication that the population of large male rock lobsters has been appreciably reduced. Before 1958, when large male rock lobsters were still in reasonable abundance, July and August were two of the principal months for landings in Fiordland waters. Subsequently major catches were made from October to March. This was probably the result of a thinning out of the larger males. In 1969, the Chatham Islands fishery showed a marked drop in July and August, and an increase in landings from October to December, when smaller fish are more abundant. Therefore, if the trend at the Chatham Islands continues to follow that of Southland, peak catches, in the future, will be obtained in the months from October to early March.

Discussion

In any previously unexploited stock there is always a sudden and abrupt rise in catches when fishing begins. This occurs partly because of availability of large accumulated stocks, and partly, where the fishery is a valuable one, as with rock lobsters at the Chathams, because there is a very rapid increase in fishing effort. As a result, a peak in the total quantity caught is reached fairly rapidly. Inevitably, this is followed by a period of adjustment when the catch falls equally rapidly and then stabilises at a level that is depend-

ent upon the availability of the species and the intensity of fishing effort. The evidence presented above shows that the peak yield from the Chathams rock lobster fishery has now been reached, and that also the peak has been reached in terms of fishing effort (catch per boat).

When the fishery began in 1965, and in the year or two following, a few boats were making enormous catches for relatively little effort. The people involved were experienced, reliable fishermen, but as news of the large catches spread, more and more people were attracted to the area. These were good, bad and indifferent, fishermen and non-fishermen alike, all anxious to make as much money as possible in as short a time as possible. However, now that catches have begun to fall quite considerably and it is necessary to work hard to make worth-while catches, most of the inexperienced people are dropping out. During 1970 there has been evidence of a decline in the fishing fleet. This will probably mean a reduction, on the whole, of the less desirable element.

There is no suggestion and no indication that the Chathams stocks are being over-fished, and from what has been said immediately above, it is apparent that the number of boats will be self-limiting. Any new fishermen going to the Chathams are now likely to be genuinely interested in exploiting the fishery and working for their living. These people can only be an asset to a viable fishery. Another important development is the increase in the number of Chatham Islands-born fishermen. In June, 1969, 15 local fishermen were in charge of their own boats,

and others were skippering various company boats. This alone should contribute long term stability to the industry.

If there is any collapse in the fishery it could only be due to economic causes (over-investment), rather than a shortage of rock lobsters. The economics of the fishery rather than the biological problems associated with the distribution and population of the rock lobsters, are the crux of the problem. Many of the mainland rock lobster catching grounds have been fished heavily for years, and although it is possible that some of these areas have been over-exploited, rock lobsters are still relatively plentiful and sufficiently abundant to enable fishermen to make a satisfactory living. It appears quite certain that the high attraction of the Chathams is already somewhat dimmed, and will disappear long before the stocks are reduced to anything like the mainland densities.

> "They began fishing there (the Chatham Islands) with a virgin stock and for that reason there must be some decline in the numbers being caught at first. But it costs a lot more to run a boat there than it does on the mainland and as catches decline boats will return to their home ports. The economics of fishing in the Chathams will eventually produce a level pattern with continuing good catches for a reduced number of boats..... there are enough rock lobsters around the New Zealand coast to last for many years yet. It is virtually impossible to make them extinct. The fewer rock lobsters there are, the

> harder they become to catch. As they reduce in numbers, more food becomes available, they grow quicker and are less likely to take the bait in the fishermen's pots". (Bay of Plenty Times, 27/2/70).

A broad estimate shows that there are approximately 600 square miles of fishable sea area which, at the peak period of fishing effort, allowed for about four square miles of fishing per boat at the Chathams. On the mainland, many rock lobstermen have much less fishing area and have also to contend with amateur fishermen, "part-timers" and skin divers, yet there is no suggestion of a serious drop in stock. Furthermore, weather at the Chatham Islands is less predictable than on the mainland, and there is less shelter, so that the number of days lost to fishing because of bad weather tend to be considerably greater.

Therefore, on the basis of experience with mainland fisheries, notably Bluff-Stewart Island landings, and allowing for the economics of operating in the Chathams, it appears that the rock lobster stocks there will be capable of providing a sustained level of production between half and two-thirds of the peak landings (see Graph 5.3.).

With reference to an early remark in this chapter regarding Slack's (Slack 1969, p.32) inclusion of the Chatham Islands rock lobster fishery in the "developing" stage, it appears that by 1969 this fishery had graduated from the "developing" stage, but not quite reached the position of a "stabilized" industry. At present it is still in the process of stabilising and it may be several years yet before the catch per unit will remain relatively constant.

Processing - General

As mentioned in the preceding section, there was a considerable time-lag between the rise in production and the establishment of adequate processing facilities at the Chathams. The first boats to the area had to freeze their own fish or tails and carry them back to New Zealand. The establishment of processing factories followed the extension of fishing around the islands, both geographically and chronologically. Road accessibility was not a necessary criterion for factory location, as the building of three factories at Port Hutt and Kaingaroa shows. Of major importance in the location of the factories was their situation close to major fishing areas and adjacent to sheltered harbours or bays. Kaingaroa, Port Hutt and Owenga had been sites for fish freezers, but, in 1965, Owenga was the only such establishment in operation. Waitangi was the most central site for a factory, situated at the point with the largest potential labour force and close to the wharf. Port Hutt offered the most sheltered anchorage in the Chathams. Owenga was chosen as the site for four packing houses, probably because of the number of permanent moorings available, its proximity to both the southern coast and Pitt Island fishing grounds, the availability of some local labour, land with a water frontage, and its accessibility by road to Waitangi. Companies based at Waitangi or Owenga often land fish on both sides of the island, and transport it by road to their respective packing sheds. Flower Pot, although not ideal in terms of shelter for small

boats, at least had a few people nearby and was the only port-of-call for cargo vessels visiting Pitt Island.

The size and sophistication of the factories varies, and many have developed from mere sheds to full processing plants with blast freezers and large cool-storage facilities. Large amounts of capital have been invested since each factory has had to supply its own electricity and water supply. Accommodation has had to be supplied for many of the workers. Except for the fishermen's cooperative freezer at Owenga, which was taken over as a going concern, all factories were brand new, often prefabricated on the mainland.

It is noteworthy that only one of a total of nine factories operating in early 1970, that at Pitt Island, was owned by Chatham Islanders, and even the Pitt Island Packing Company has had financial and administrative backing from a Christchurch exporting company.

The Chatham Islands Fishermen's Cooperative was taken over in 1966 by a Northland company. At that time, if the catch was to be landed live it was kept on the vessel's deck, either loose or in sacks. In winter, large rock lobsters were often kept alive on deck under kelp or wet canvas covers for up to three days. It was usual practice for vessels returning to New Zealand with frozen rock lobsters in their holds, to carry the last day's catch on deck in this manner.

Once ashore, tailing of both frozen and live rock lobsters was carried out at Owenga. Tails were washed in sea water drawn from Owenga harbour, and packed in 50 lb. waxed cardboard,

polythene-lined containers which were later shipped to the mainland for export packing. A processing charge of 1/6d. per pound of tails was charged. No body meat was extracted, the bodies being dumped in fern country several miles away from Owenga and a quarter of a mile off the road, no public offence being caused.

By June, 1966, a Wellington company was building a shore processing plant at Port Hutt, and a Southland partnership was constructing a fish shed at Waitangi. As yet there was no processing shed or freezer on Pitt Island and most vessels fishing in that area had to freeze their fish whole for later discharge either at Owenga, Waitangi or New Zealand.

March, 1967, saw three factories operating, and a fourth in the final stages of construction on Chatham Island, and a small freezer had been established on Pitt Island. By 1968, a total of nine factories were operational and more or less standard methods of extraction of the tails had been devised. Because all the factories had difficulties with actually landing their fish, helicopters were introduced into the fishing operations. The ability of the helicopter to land fish safely and quickly, in almost any weather, direct to the factories, removed the tedious, multi-handling and often hazardous processes of transferring the fish ashore by dinghy, barge, pontoon and "flying-fox" as had previously been done at various factory locations.

Common methods and factory layout resulted from a realization of the most efficient mode of extraction which is in use at present.

Tailing and Packing

Fish are delivered live to the factories by helicopter or vehicle and placed directly, or hoisted, into bins above the tailing benches. From this level they are transferred by gravity to the tailing benches. (Plate 5.4.). At the tailing bench the operator removes the tail and the anal tract. Each tailing bench is equipped with a fixed concave tailing knife, shaped rather like a shoe-horn, and a high-pressure water gun. Firstly the anal tract is removed to prevent faecal contamination of the frozen product. This is achieved by inserting the perforated nozzle of the water gun into the base of the tail so that the sphincter muscles are cut. When the trigger of the water-gun is pressed the anal cord is blasted free of the tail meat into the cephalothorax. The fish is then slid onto the fixed knife blade which cuts the membrane at the base of the underside of the tail. With a sharp twist, the body is then separated from the tail. Tails are then washed in sea-water in large stainless steel or plastic tubs, weighed and graded according size. The exposed meat at the base of each tail is then wrapped in cellophane and packed according to specific size and number into 20 lb. export cartons. Full export-standard packing did not become universal until 1968, but it immediately helped raise the standard of the frozen product which no longer required thawing and repacking on the mainland.

Landings usually take place in the afternoons when vessels return after a day or two days fishing. Tailing begins

PLATE 5.4. Processing plant at Owenga. The upright gantry construction on distant side of factory is used for raising baskets of rock lobsters to bins above the tailing benches.

immediately, and, if large quantities have been caught, may proceed well into the evening. In the flush of large runs, some tails may not be packed on the day of landing and may have to be held overnight in freezers for packing the following day.

Labour

The labour force at the several factories varies according to the size of the company and reflects the seasonal nature of catching. In general, all tailing and freezer work is carried out by men, and the wrapping and packing by women and teenage girls. Initially, most factories intended to use local workers, with the aim of avoiding the necessity of providing accommodation and travel expenses of mainland workers. However, it was found that many Chatham Islanders did not readily adjust to working long and irregular hours when they had long been used to a free and easy way of life. Many saw no reason to care about money since they had lived quite happily before the factories appeared. In many cases staff problems arose, and some of the factories found that it suited them better to employ full-time labour from the mainland and rely on island labour more for casual work. After all, it was not as easy for mainlanders to get off the islands as it was for the islanders to go home if they got tired or fed up. It must be stressed, however, that this was not true of all island workers, but there was a noticeable trend towards factories providing more accommodation for an increasing mainland proportion of workers. It was also true that the larger number of factories could not be staffed by

local labour alone, as it has always been in short supply. However, those islanders who did cease work in the factories did not find re-employment at farming or construction, but generally took employment on fishing vessels.

One of the last and largest factories at Owenga built an accommodation block, from the outset, capable of housing over 20 people, and most other factories have had to provide living quarters for their staff.

Rationalisation in 1970

The attraction of processing firms to set up plants in the Chathams is analagous to the attraction of fishing vessels. However, the processors were more concerned with the total catch than the catch per boat which is usually foremost in the fishermen's eyes. Most companies have invested large amounts of capital, some over $200,000 on factories alone, even with the knowledge that the level of production must ultimately fall.

By and large, factories are more up to date at the Chathams than they are on the mainland. The management are aware that if they do not produce a first-class product their industry could disappear and all the capital invested in it would have been to no avail. A good quality product means good prices, but the continued existence of all nine factories must inevitably depend on sustained high catch rates. Profitability can only be high when throughput is high. Overheads are extremely costly compared to similar factories on the mainland, so high, in fact, that the substantial fall in landings in 1969 placed most factories in tender financial positions. This was clearly

shown in early 1970 when, after the summer season, two factories ceased operations completely, one was rumoured to be in receivership, and a general tightening of the economy could be detected in the operations of all the remaining plants.

This, however, may be regarded as inevitable, as the establishment of nine different factories at only five locations was clearly not the most rational way of handling the catch. Each factory was preventing the others from attaining suitable economics of scale. The failure of two factories, and the worsening of the financial position of some of the remaining plants, is further evidence of the stabilising of the industry and a realization of the fact that the "boom" is over. Also apparent in the case of the two companies that have already failed are elements of poor planning, management and supervision.

Greater Utilisation of the Catch

It is expected that those factories remaining will continue to try to reduce operating costs and further attempt to find a greater utilisation of the whole catch. Plans for the extraction of body meat and claw meat have often been confounded by a shortage of labour and the high profitability of handling tails alone. Table 5.5. shows that only one-third of the live-weight of the rock lobster is utilised by the industry which mainly exports frozen raw tails, the remaining two-thirds being thrown away.

The fact is, that the fraction of the meaty muscle of the tail which is left in the cephalothorax after tailing is relatively minimal when tailing has been done efficiently.

Table 5.5. Composition of Whole Rock Lobster

Live Weight ozs.		Body & Legs Weight %		Tail Weight %		Loss of body fluid (blood) on tailing live	
Variations	Average	Variations	Average	Variations	Average	Variations	Average
9½ - 15	12	54.1 - 60.4	65.4	33.9 - 44.1	39.4	0 - 8.2	3.5
17½ - 23¾	21¼	55.1 - 68.3	62.3	30.5 - 42.5	34.9	0 - 8.8	3.2
25 - 31¼	28½	57.6 - 65.4	63.0	26.9 - 35.8	33.4	0 - 8.9	4.1
32 - 50	39	62.3 71.2	65.8	27.6 - 36.5	31.4	0 - 5.4	3.1

(Source: Gilberg, Y.C. 1968)

Despite this, the meat in the claws, and that which is left in the body, is surely worthy of recovery. However, claws and bodies must be cooked before the extraction of the meat is possible, and the employment of extra labour has not been found, until recently, to be an economic proposition to the industry as a whole. The industry was faced with many practical difficulties. Firstly, the return on body and claw meat is low. Tails are 90 per cent meat whereas carcases and legs are only 12½ per cent meat. Extraction is slow and time-consuming for highly paid staff, and as the meat will not readily come away from the shell if the fish has been frozen and then cooked, the bodies must be dealt with as soon as they come into the factory. It is impractical to have staff working on high-cost carcases while profit-making tails deteriorate.

More emphasis has been placed over the last two years on utilising body and claw meat, which is generally extracted by hand by female operators at a contract rate of 20 cents per lb. However, the amount of wastage of this product continues to be very high, and over the years since the fishery has been operating, losses of body and claw meat worth over $1 million have probably occurred. This is particularly disturbing as many large claws weighing up to two and a half ounces have been pulverised and pumped into the sea as effluent, while tails weighing only two ounces are being packed for export in Otago where different size regulations apply.

The present situation regarding processing at the Chathams is one of balance and rationalisation. The number of factories

is probably still too high, and one of the causes of the higher costs of production at the Chathams is the relatively small scale of operation and fragmentation. In the interests of greater economy of scale, it appears that four or five larger sheds could easily handle present and foreseeable catches.

Through 1969 and early 1970, there has been a noticeable revival, though still relatively small, of wet fish exported from the Chathams. Increasingly, frozen shipments of fish to the mainland are including blue cod, groper, butterfish, paua and crayfish body meat. It is expected that this trend will continue as an integral part of the movement towards a greater use of the wealth of the fishery and established plant, (i.e. both factories and fishing vessels).

The Value of the Chatham Islands Rock Lobster Catch and the Marketing of New Zealand Rock Lobster Products

Value of Chatham Islands Catches

The value of Chatham Islands rock lobster catches is only available in the form of the total landings each year. This figure is the value of the catch when landed. Once processed and exported, the catch from the Chathams is amalgamated with the total New Zealand exports so that the export prices realised for Chathams fish alone cannot be separated from the total New Zealand figure.

Landed value figures for the Chatham Islands for the years 1965 - 1969 are shown in Table 5.6.

Table 5.6. Landed Weight and Value of Chatham Islands Rock Lobsters, 1965 - 1969.

	Landed Weight cwt.	% change each year	Value Landed $	% change each year
1965	39		798	
1966	24965	+ 63912.8	434,446	+ 54341.8
1967	65080	+ 160.6	1,017,103	+ 134.1
1968	117032	+ 79.8	2,490,941	+ 144.9
1969	81451	- 30.4	2,957,499	+ 18.1

Source: Marine Dept.

Although the percentage change of the landed weight figures in Table 5.6. are interesting in themselves, it is the percentage change figures for the value landed which are the most significant in this table. In 1965-6 and 1966-67 the value of the catch did not increase as rapidly as the catch itself, but in 1967-8 and 1968-9 the higher prices paid for catches are very evident. In 1967-68 the increase in landings was 79.8 per cent, while the increase in the total value for the whole catch was 144.9 per cent, and for 1968-9, even though the catch had declined by 30.4 per cent, the value had increased by 18.7 per cent, clearly evidence of improving prices paid for the product. This, of course, would offset to some extent the falling catch per boat after October 1967, and would undoubtedly have been one of the factors which continued to attract boats and processors to the Chathams after this date.

From the figures for the total New Zealand rock lobster landings, landed value, total exports and value of exports, it is possible to derive some interesting facts. In 1967, the

average whole fish landed at $29.16 per cwt. They were exported at $129.64 per cwt. (f.o.b.). As the ratio between body weight and tail weight is approximately 3:1, one would have expected an f.o.b. realisation of about $90.00 plus the processing charge. In 1968 the averages were $34.61 and $204.00. Over this one year the landed value rose by less than one-fifth while the export price went up by more than half. By 1969 these averages had reached $50.60 and $244.88.

In other words, the landed values must be treated with caution as they appear to be understated, probably for taxation reasons.

Marketing

Once transferred from the Chatham Islands to New Zealand it is not possible to separate Chathams products from those originating on the mainland. However, in terms of export quantities and earnings, the impact of the Chathams fishery is quite noticeable, especially from 1966 to 1969.

The overseas market for New Zealand rock lobster, mainly in United States of America, opened around 1948. Table 4.1. shows the trends in exports and the value of all frozen rock lobster products.

Almost 100 per cent of the Chatham Islands catch is exported as frozen tails. Body and claw meat is sold on the domestic market only. Some New Zealand rock lobsters are exported whole, either cooked or frozen. Negligible amounts are canned. In 1969 only about 2 per cent of the exports of rock lobster were labelled "prepared", all the rest were "frozen".

From Table 4.1., it appears that peaks of exports of rock lobsters coincide with peak production periods, firstly in Bluff and Fiordland, and then at the Chathams. From 1965, the increase of Chatham Islands production enabled New Zealand to lift its sales of frozen lobster to the U.S. and other markets, to reach a record quantity of 62,759 cwt. valued at $12,728,750 in 1968. However, despite a fall in exports to 58,131 cwt. in 1969, a record export realisation of $14,235,376 was achieved.

Location of World Markets

Major overseas exporters of frozen rock lobster products are Australia, South Africa and Brazil. Current New Zealand export quality standards enable the New Zealand product to compete openly on the world market. Most of New Zealand's rock lobster exports take the form of frozen tails which are sold to the United States. This is clearly evidenced by the fact that for the year ending 30th June, 1969, the United States took $14.2 million worth of rock lobster tails out of a total export value of $15.4 million. For the year ending June, 1970, the total export return had dropped to $11.3 million, of which the United States took over $10.3 million worth.

Within the United States, most New Zealand exports enter along the Atlantic seaboard, with New York being the main port. This contrasts with the pattern of Australian tails which are mainly handled by Californian importers. The east-west division of New Zealand and Australian tails on the United States market is by no means rigid, however. The Australian

product reached the western American market before the arrival of large quantities of New Zealand tails, so that with a supply and distribution network for Australian fish already established, few western brokers have been inclined to handle New Zealand exports. This, however, is changing as the reputation of New Zealand tails as a quality product increases. Generally, New Zealand exporters supply one large broker although some companies sell to several merchants who are responsible for the internal distribution within the United States.

Outside of the U.S.A. the major markets for rock lobster are France, which takes some tails and a number of whole frozen rock lobsters, Australia, Puerto Rico, Canada, Guam, Japan and a large number of islands in the Pacific. The increasing exports in the Pacific area are associated with the development of large luxury hotels in such areas as Fiji, New Caledonia and Papua-New Guinea. Guam imports relatively large amounts of rock lobster, apparently for personnel and families at United States military establishments.

In general, New Zealand exporters are currently supplying a greater number of markets than a few years ago. In the year to 30th June, 1970, the number of destinations of New Zealand rock lobster exports rose by a further 5 countries. (Table 5.7.). The reasons for broadening the market lie in an apparent wish among New Zealand exporters to avoid a total reliance on the U.S. market which, although offering the best prices, is liable to the same fluctuations as any other market.

Table 5.7. Destination of Rock Lobster Exports (Fresh, frozen and chilled) for years ending June 30th, 1966 - 1970.

1966	C.W.T.	$
U.S.A.	96.6%	97.7%
France	1.5%	1.0%
Total	30,022 cwt.	$4,218,332
1967		
U.S.A.	93.3%	93.3%
Australia	2.2%	2.1%
France	2.0%	1.6%
Total	40,773 cwt.	$5,072,632
1968		
U.S.A.	93.4%	95.3%
France	3.8%	2.8%
Australia	1.8%	1.0%
Total	54,595 cwt.	$9,114,800
1969		
U.S.A.	88.5%	91.8%
France	4.8%	4.1%
Australia	6.0%	3.5%
Puerto Rico	0.2%	0.2%
Total	65,207 cwt.	$15,473,395
1970		
U.S.A.	89.7%	91.2%
Canada	2.3%	2.4%
Puerto Rico	1.9%	2.0%
France	2.1%	1.9%
Australia	2.4%	1.3%
Total	46,124 cwt.	$10,608,714

Late in 1969, and early in 1970, the American market tightened as a result of recession in the United States economy. The average prices for all sizes of New Zealand tails dropped from $3.65 per lb. in March 1969 to $2.55 per lb. in November

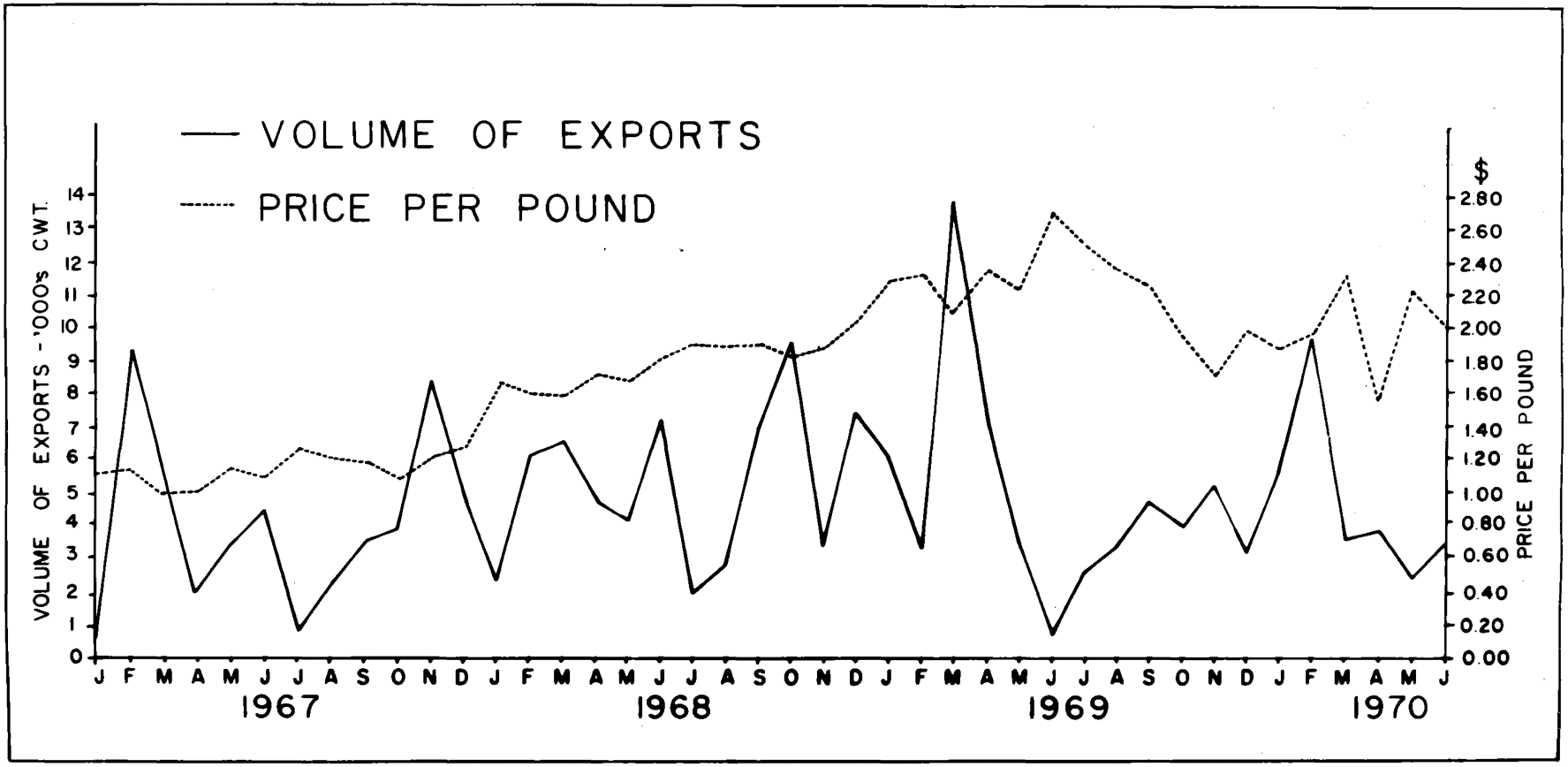
of that year. Since that time, some recovery raised the price to $3.15 by July, 1970. It remains inevitable, however, that the United States of America will continue to be the greatest single importer of New Zealand rock lobster exports.

In this light, it is not surprising that the New Zealand government, and the Fishing Industry Board, has been continually encouraging the export of top quality products to meet all the requirements of the sophisticated U.S. market. In this they have achieved good results and have overcome such complaints as the following:-

> "In some consignments buyers find "dead" tails which go musty and let off an unpleasant smell when prepared. Australian crayfish is much preferred because of its regular quality. The best from New Zealand is very good, but the worst is horrible. Unfortunately, the poor quality tails rob the good article of some of the premium which should come its way. Quality and presentation of goods have let New Zealand down on some occasions". ("Commercial Fishing", April, 1968).

But, by 1970, the standards of New Zealand tails has improved greatly as a result of strict supervision and inspection of processing works, handling in transit and the export product itself, all of which are required to pass rigid examinations by Fisheries and Agriculture Department inspectors. Trends in overseas prices are shown in graph 5.4.

Over all, the present outlook for New Zealand rock lobster exports is good, but marketing abroad could benefit from a more



GRAPH 5.4. Total New Zealand quantities of Rock Lobster exports (all forms), and average prices per pound (lb), June 1965 - June 1970.

coordinated system of fewer, but larger, exporters, releasing goods on to the American market at times of high prices and at periods when exports from Australia and South Africa are seasonally small.

New Zealand fishing exporters are aware that uncoordinated marketing, and the failure to relate supply more effectively to demand, has led to slightly depressed prices and the loss of possible export earnings. There are, however, conflicting views of reconciling the achievement of maximum export returns, and the preservation of flexible marketing techniques offering wide scope for individual initiative. On the one hand, there is dissatisfaction over the present laisser faire method, but, on the other hand, there is no unanimity within the industry on the establishment of a marketing authority responsible for the sale and distribution of fish.

There is no doubt that rock lobster is New Zealand's chief fish export earner, and should continue to offer high returns in the future. The percentage of exports originating in the Chathams will decline along with production there, but it is quite certain that when the fishery settles down and stabilises, the contribution of Chathams fish will continue to play a significant part in New Zealand's rock lobster exports.

CHAPTER SIX

Effects of the Rock Lobster Industry on the Chathams Islands

Situation at 1965

In 1965 the economic position of the Chatham Islands did not look promising. As noted in Chapter Two, the prices for wool on the world market had dropped alarmingly, and with additional freight expenses, many Chatham Islands farmers were faced with severe economic problems. Their position was aptly described by the President of Federated Farmers (Chatham Islands):

> "The actual production of wool has not dropped, but the price has not made it economic to ship out wool of lesser quality. Once practically all the farmers shore their lambs, this year I estimate that only 50 per cent of the farmers bothered. Lambs wool was at a very low ebb, and it cost more to handle each lamb than the farmer would get for the fleece..... On today's fluctuating prices we don't know what we'll get on the market. That's why we have not sent our smaller wools and have not shorn our lambs". ("Christchurch Star").

Prices for sheep exported to Lyttelton, and thence to the Addington markets, slumped along with wool and store cattle. After freight and all production costs had been taken into account, the profit margin for most Chathams farmers was very fine, while some farmers made no profit at all.

Hope for a revival in traditional sheep-farming on the islands became centred around the Chatham Islands Meat Company (CIMCO). In 1965 a new element was introduced into the Chatham Islands farming economy, by Mr P. Smith, with the opening of an abattoir operating under farm partnership. In 1966 the Chatham Islands farmers collectively bought out the abattoir and formed CIMCO, investing over $40,000 of local capital. Then, with financial assistance from the State Advances Corporation ($120,000) and expert advice from a mainland meat company, the plant at Te Awatea was greatly expanded and streamlined. Killing started in April, 1968. The company intended to process-pack boneless mutton and beef for the domestic and export market, with emphasis on a specialty pack of boneless mutton for Japan. With the cessation of stock trips to the mainland at the end of 1967, CIMCO embodied the future hopes of the farming community on Chatham Island. Reliance would no longer be solely on wool and stock exports. Beneficial or not, the emphasis was changed to wool and meat. Pitt Island farmers, however, were now entirely dependent on wool as there was no way to transport their sheep to either Te Awatea or Addington.

In 1965, the fishery, (as mentioned in Chapter Four), was based on blue cod caught by small vessels mostly operating at Owenga and supplying the cooperative freezer there. Several large vessels from Wellington also fished the area. Employment existed for fewer than thirty islanders in both the catching and processing sectors.

Traditionally, most Chatham Islanders have been farmers, and little, or no work at all, was available for women. Few opportunities existed for adolescents, most of whom left the islands to seek work on the mainland.

By 1965, only 36 miles of roading had been surfaced with metal or gravel. In other words only 6 more miles of metalled roads had been added since 1949 when the Government roading programme was completed. It is of interest, that of the £99,923 spent on the roads at that time, the Chatham Island County Council's share was only £11,000. The balance, £88,923, was paid by Government.

Roading in the Chathams has always been expensive owing to the shortage of road metal and labour, and the high costs of importing and operating heavy plant. The peaty country does not offer good road foundations and efforts to overcome subsidence and bogginess cost large sums of money. Large quantities of shell from the beaches are used on the roads, but, like the lime used on some roads, it crushes readily under the wheels of vehicles so that it is either pressed quickly into the peat or is blown away as dust. Even the best roads in the Chathams are narrow, rough and sinuous compared with mainland country roads.

The shipping service was originally subsidised to ensure a reasonably regular transport of passengers, freight and live-stock between the islands and the mainland.

As the only local body on the Islands, the Chatham Islands

County Council is responsible for all works. Income is mainly obtained from the unique import and export levy system. The Council has always been hamstrung by the serious fluctuations of income from year to year because of the strong dependence on wharfage receipts. Differences in the volume of exports and income are influenced more by the prospective market realisations on the mainland than the Council's expected capital requirements. Bad weather may mean the loss of one or more trips which can have particularly detrimental effects on the revenue for a particular year.

Council expenditure had been increasing steadily up to 1960, with major increases being in administrative and loan charges. In 1960, loan charges amounted to 40 per cent of the Chatham Islands County Council's revenue, and administrative overheads, (i.e. general works and administration), reached 73 per cent. These two items on their own exceeded the total revenue for 1960 by £1,638. By 1961, the Council had a bank liability of £10,338, almost a full year's revenue on the basis of the dues in operation at the time.

The following table (Table 6.1.) shows the degree of dependence of the Chatham Islands County Council on import and export dues for its revenue.

Table 6.1. C.I.C.C. Revenue (£), 1956-1960.

	Dues and Wharfage £.	Other Revenue £[1].	Total Revenue £
1956	15,133	574	15,707
1957	9,660	2,331	11,991
1958	7,067	1,512	8,579
1959	10,205	1,265	11,470
1960	8,841	1,471	10,312

1. Excludes receipts from subsidies, grants and loans.
Source: C.I.C.C. Annual Balance Sheets.

The Council was forced to take drastic action, and, late in 1961, successfully applied to have the dues raised. The increases almost doubled the existing rates and were most unpopular. However, 1964 was the first year since 1950 in which the Council showed a profit. But, in order to achieve this, the Council was forced to keep a tight grip on expenditure, and was unable to maintain a reserve fund as is usually held by County Councils for such items as plant renewal.

So, in 1965, when it appeared that the Council was clear of financial crises, it was suddenly faced with greatly increased demands on its facilities. Major needs have occurred in roading and amenities for the fishing industry.

Requirements of the Rock Lobster Industry

The granting of Harbour Board powers, duties and functions to the Chatham Islands County Council, (Chatham Islands Harbour Control Order, 1967), has been accompanied by increased expenses. Among the many development projects faced by the Council were the provision of a slipway, wharf and cargo-handling improvements at Waitangi and jetties at Owenga and Flower Pot.

Slipway facilities had previously been almost non-existent on the Chathams. Most vessels have either had to steam or be towed back to New Zealand, or be carried on the deck of the "Holmdale", in order to undergo surveys and refits. (Plate 6.1.). In terms of centralization, Waitangi would be the most favourable site for the slipway, but fishermen and boat-owners are unanimous in their objection to placing the slipway there,

PLATE 6.1. Fishing vessel carried as deck cargo on forward hatch of M.V. "Holmdale".

because of the prevalence of ground swell, which would usually make it dangerous to slip, and un-slip, boats. Port Hutt is not ideal for a slipway, but is by far the best location in the Chathams, and would be workable most of the time. However, no road links it with Waitangi, so the County Council is also faced with constructing a road. A workshop and shipwright's facilities alongside the slipway are also required, but a good road connecting Port Hutt is necessary if one workshop is to provide for all Chatham Islands needs.

The old, "cross-tee" wharf at Waitangi was built in 1934, but is not useable in all weathers. In marginal conditions, severe strain and pounding is likely to occur. As a result, continual maintenance has been necessary. With increased visits by vessels servicing the rock lobster industry, and gradual depreciation through old-age, maintenance costs have been extremely high. The County Council has also been faced with the need to provide berthing, fuelling and watering facilities for the fishing fleet. Because of the increase in shipping and fishing, congestion at the wharf is serious almost all the time. The present wharf-shed is 30' x 97' and is over 30 years old. Much of the cargo is now being handled in containers, but the raised floor of the wharf-shed does not permit the entry of fork-lift vehicles. Often, much of the cargo must be left either in the congested yard or along the verge of the wharf road, whence it often "disappears" overnight. The wharf approach is 375 feet long but only nine feet wide. This

requires widening and strengthening to cope with the larger vehicles and heavier loads now using the wharf. From 1965 - 1968 almost 27 per cent of the total wharfage receipts have had to be expended on wharf maintenance and cargo handling.

The Rock Lobster Levy Dispute

The Chatham Islands County Council could not afford to carry out the developments mentioned above, despite greatly increased receipts. It therefore decided to apply to the Government to impose a levy on rock lobster tails in order to raise a loan to finance wharf and harbour improvements. At this time, August, 1966, there appeared to be no opposition to this move because everybody seemed to agree that the islanders should receive some long-term benefits from the booming industry which even the most optimistic people believed could sustain the very high yields for only about ten years. Fishermen appeared to concur that existing charges were low and that they would benefit from the developments as much as the locals.

However, it was not until January, 1969, that the import-export dues on rock lobster tails were increased from $8.00 per ton to four cents per lb. ($89.00 per ton). By this time, however, the fishing industry had changed its mind and was opposed to the increase. Under pressure of fishing interests, and because the Chatham Islands County Council's plans had not been finalised, Government reduced this as an interim measure in September, 1969, to two cents per lb. Following the finalisation of the County Council's proposals, and after negotiations between the Council and the fishermen, a modified scheme was

prepared involving $553,000 for harbour works and $476,000 for roading.

On the 7th November, 1969, the dues on rock lobster exports were restored to their original level of $8.00 per ton, plus a special levy of two and a half cents per lb. as the fishermen's contribution to the Chatham Islands County Council's special harbour works fund. Government agreed to guarantee loan repayments up to $500,000 over 10 years by the Council, and to grant a "dollar for dollar" subsidy to the County Council to a maximum of $10,000 per annum to assist it carry out its works programme.

Quite clearly then, the Chatham Islands County Council was able to use the presence and wealth of the rock lobster industry as a major bargaining force for necessary works.

The Chatham Islands Development Committee sought to justify Government support for the Councils development programme on the grounds that the total overseas earnings derived from the Chatham Islands, for the year ending 31st March, 1969, were $8.457 million out of the New Zealand total of $947.026 million. Without counting taxation, the Chathams, therefore, contributed an estimated 0.983 per cent of the New Zealand total export earnings. This, they claimed, entitled the Chathams to a greater share of Government assistance.

On the one hand, it is not generally appreciated that, disregarding the normal assistance the Chatham Islands residents receive as taxpayers in the form of social security benefits, assistance for schooling and the great deal of technical and

professional advice and aid given free of charge to the County Council, Government expenditure in, or on behalf of, the Chatham Islands has averaged $511,000 per annum over the last three years. This is already a high level of assistance for a community and area of this size.

On the other hand, however, there are no state highways on the Chathams, no sealed roads, no bus services, no central power scheme, no central water supply, no railways and no television.

> "Only about 40 per cent of the homes on the Chathams have flush toilets compared with 93 per cent in New Zealand; 81 per cent still use wood and coal ranges compared with 7.2 per cent; 23 per cent of the homes do not have domestic hot water supplies compared with only 1.5 per cent in New Zealand". (Chatham Is. Development Committee Representation to Wellington, 1969).

These figures must be considered, along with the lack of higher employment opportunities, as playing an important part in discouraging migration to the islands, which have held a fairly static population in the period from the Depression of the 1930's till 1966.

Roads

Motor vehicles registered at Waitangi in June, 1966, numbered 72, compared with the 214 registered in June, 1969. Traffic in these three years trebled, mostly because of the

rock lobster industry. Mainland fishermen and their families who settled around the factories, especially at Waitangi and Owenga,were accustomed to owning a motor vehicle and many imported their own transport. Major wear and tear on the roads, however, appears to have been caused by the rapid increase in numbers of heavy motor vehicles. Each factory requires a lorry for carrying exports and supplies to and from the wharf and general stores. The Waitangi-Owenga road has probably suffered more than any other. With four fish packing companies at Owenga, and the meatworks at Te Awatea, all sending their products to Waitangi, and some rock lobsters landed at Waitangi and Owenga being transferred to opposite locations, this road has carried greatly increased heavy traffic. The County Clerk estimates that the packing companies account for at least five times the traffic of the meatworks. The road is mostly one lane with a high camber, with the result that passing is dangerous, and overtaking is impossible without the slower driver's consideration. Increased numbers of flights to Te Hapupu have also meant high maintenance costs on the road to the ford.

Other roading projects require large construction operations. With the factory, and proposed slipway and workshop at Port Hutt, a road connecting it with Te Kairakau is essential. With road access, factory products could be transported to Waitangi. An eight-mile section of road is required from Kaingaroa to Te Hapupu to enable the factories at Kaingaroa to take advantage of the present unused freight space available

on the Bristol freighters. Pitt Island also requires a road linking Flower Pot and Glory Bay. Often the "Holmdale" has approached Flower Pot, and then had to shelter for a week because of unsuitable weather for discharging cargo by surf-boat. With a road link from Flower Pot to Glory Bay, cargo could be discharged on either side of the island, depending on the weather, without delay.

Further development works required by the Chatham Islands County Council, potentially valuable for improving access and social conditions, are:-

1. - A road providing access to Taupeka, Wharekauri and Kaingaroa.
2. - Sewerage scheme for Waitangi.
3. - Water supply for Waitangi.
4. - Breakwater at Waitangi to eliminate swell.
5. - Electricity reticulation.
6. - New airport.

The development of the Chatham Islands for various reasons has not kept pace with the rest of New Zealand. As a small rural community until the advent of the rock lobster industry, this was serious enough. With the meteoric growth of the industry based at the Chathams, development has suddenly become an urgent necessity, particularly such development as will assist both the industry and the farmers.

Population Distribution

The establishment of the processing and packing companies brought a relative influx of personnel and temporary settlers.

Although population changes occurred, it must be stressed that they were not of tremendous overall importance. Greatest increases in population were to be found at Waitangi, Owenga and Kaingaroa. The resident, largely agricultural, population has not undergone much change in location, although, as will be described in the following section, changes in employment have taken place. Approximately 450 fishermen were present on boats in Chatham Islands waters during the peak months of fishing, but only a small percentage of these actually lived on land for long periods. Of the early arrivals among the fishermen, almost all lived aboard their vessels, working hard when the weather was favourable; sheltering, resting and mending gear at other times.

The only element of the population attracted by the activities of the fishing industry to have made a noticeable impact on the settlement pattern of the islands were those fishermen and process workers, and their families, who set up permanent or semi-permanent residences. These people have established themselves in the close vicinity of the factories, either living in caravans, huts or cottages. Very few houses of mainland dimensions have been established. Caravans are particularly popular, and a Holm Shipping Company employee estimated that between 40 and 50 caravans had been shipped to the islands in the last four years. Often the caravans have been elaborated for more comfortable living by the use of "lean-to" extensions, rainwater tanks and electricity. The rock lobster factories have become the centres of population concentrat-

ion. In the vicinity of Owenga a number of dwellings had existed for many years as the homes of farmers, fishermen and processors. Round Port Hutt, Kaingaroa, Flower Pot, Owenga and Glory Bay collections of caravans and huts of varying degrees of sophistication and permanency have sprung up.

With the exception of Waitangi, where the number of permanent dwellings has risen substantially, largely as a result of the in-movement of Government and County Council employees, the temporary nature of the dwellings testifies to the intended transcience of much of the new population. The number of housing permits issued over the last five years has been small. From 1966 to February, 1970, only 21 houses, including those for Government and Council employees, have been constructed. Ten of these have been built at Waitangi and Owenga. Costs of building in the Chathams are at least twice those in the mainland, due to high freight costs, labour costs, and the need to provide accommodation for construction gangs from the mainland.

In general, therefore, the greatest changes in the population distribution have taken place in the vicinity of the packing houses, and are mainly attributable to the existence of these factories. In terms of rural settlement, little has changed. Virtually no alteration of the full-time or part-time farmers' residential location has taken place. However, the emphasis placed by many farmers on their land as the source of their income has changed radically.

Agriculture

Prior to the end of 1965, farming was the major income source. Fishing was only of secondary importance. Within a few years after the bonanza started, this order had been completely reversed. What has occurred is a shift in investment from landed property and agricultural production, to investment in fishing capital. This is amply reflected by the comment by a leading Owenga farmer that the greatest benefit to be gained from owning a farm in 1969 was that it made good security for a loan to buy a fishing boat. This may have been an exaggeration, but it is quite clear that since about 1965 farming in the Chathams has not been a particularly profitable occupation. However, to attribute the decline in agriculture solely to a greater effort expended by farmers in fishing rather than farming, is to ignore the very important effects which the world market has had on Chatham Islands agricultural exports.

As noted earlier, in 1966 the Chathams farmers showed their faith in their land by investing over $40,000 in the Chatham Islands Meat Company. However, the company is presently in receivership owing to financial losses. In its first year of operation it lost $7,852, in the second year (1968), $26,402, and to May, 1969, $27,242. These losses included interest but not depreciation.

The company's difficulties have been economic (communications and transport to New Zealand), sociological (rivalry

between island farmers and distrust of outsiders stemming from unfulfilled promises from the mainland), and political (how much any government should promise in help to the Chatham Islands). The company's biggest challenge, however, was fortuitous. The potential of the rock lobster industry was unknown when the cooperative, CIMCO, was formed, but the rock lobster industry has coincided with CIMCO's three debit years of operation. So many Chatham Islands farmers were attracted to the big money and ready cash available in direct or ancillary work as a result of the rock lobster boom, that they have not had the time or the inclination to supply the meatworks with sheep or cattle. Labour was not available to operate the works to capacity. Killing facilities were not fully utilised, and a lack of continuity of supply resulted when farmers, rostered to send in stock, elected to be out fishing. With high costs and overhead expenses, the price offered to farmers was very low; (only 75 cents for adult sheep in 1969). A lack of confidence began to appear, even among the shareholders, especially when large amounts of money were owed for stock sent to the works in previous years. The effect of the rock lobster industry on the meatworks shows, most clearly, the change from investment in agriculture to investment in fishing.

The cooperative fish freezer was bought out by private enterprise. At the same time private enterprise sold the meatworks to an agricultural cooperative. Perhaps the presence of cooperative organization reflects the struggle for survival of each activity.

Those farmers who have not gone fishing are mainly those with larger holdings. They have been affected however, since they relied on the smaller farmers to provide seasonal labour. Following the development of the fishing industry, very little seasonal labour has been available. This was clearly exemplified in the 1969-70 shearing season, when one run-holder was unable to obtain a single shearer on the islands, and was forced to pay the additional costs of transporting shearers from the mainland. (H. Pierce, Waitangi West, pers. comm., 1970).

Farm production has, for many years, been limited to sheep and cattle. With naturally high soil fertility and year round grass growth, topdressing is practically unknown. Despite this, the best-grassed areas of Chatham and Pitt run 3 - 5 stock units per acre. However, there are thousands of acres of wet peat and fern areas that carry less than half a stock unit per acre, and on the poor peat "clears", only one stock unit for every ten acres is carried. Wool weights are fair (8 - 10 lbs. per head), but the medium strong cross-bred wool is generally of inferior quality.

The typical mainland farmer sends all his wether lambs to the works, as well as his cull ewes; lambs outnumber all other classes of sheep sent to mainland works by about 4 : 1. On the Chatham Islands the farmers keep virtually all their lambs and send adult sheep to the works. Until the meatworks were established, the islands' sheep were kept mainly for their wool,

hence the high proportion of dry sheep on the islands.

As a natural consequence of the smaller farmers engaging almost full-time on fishing, the standard of their farming, stock, fences and pastures has dropped markedly. The question must be asked whether the increased income derived from fishing is going to be sufficient to restore pastures from their often reverted state when farming and fishing combined will be required to furnish an adequate living.

Internal Communications

Internal communications on the Chathams have been only slightly affected since the development of the rock lobster industry. As mentioned previously, very few extra miles of roading have been added, but the increase in number of motor vehicles has resulted in a greater mobility of the population. More frequent visits are made to Waitangi, especially to collect mails and cargo which arrive with much greater regularity. Although this has placed greater strain on the road maintenance resources of the Chatham Islands County Council, it has permitted greater social intercourse, among both locals and mainlanders, which has probably helped break down the geographical isolation and segmentation of many groups of Chatham Islands society.

In 1967, the first helicopter was sent to the islands to work with the fishing industry. By 1968, four helicopters and one Cessna light aircraft were operating in the Chathams. These machines immediately had an effect on internal transportation. They were extremely valuable for rapid movement of

people as well as cargo. Over land and water, the helicopters really came into their own as transport between Waitangi and Hapupu airstrip. By conventional vehicles this trip entails a four mile crossing of Te Whanga Lagoon. The outlet to the lagoon became blocked in October, 1968, and the resultant rise in water-level made crossing by vehicle hazardous. Helicopters were used on numerous occasions to ferry passengers, goods and mails to and from the Waitangi side of the lagoon to the aeroplane. Helicopters also proved invaluable for search and rescue operations, transport of goods to isolated places and the rapid carriage of injured and sick people. Their presence meant that no point on the islands was absolutely inaccessible.

However, because of the decline in fishing, the last helicopter left the islands in August, 1970, and so this valuable facility was lost to the islands, making the need for further roading and re-siting the airstrip even more imperative.

External Communications

A: Air

Air communication with the Chathams has always been hindered by the lack of a suitably placed airfield. Up to March, 1967, aerial communication was carried out by R.N.Z.A.F. Sunderland flying boats which landed on Te Whanga Lagoon. An average of about 17 flights per year were made between Evans Bay (Wellington) and Te Whanga Lagoon. Following the withdrawal of the flying boat service in March, 1967, an air service was provided between Wellington and Te Hapupu by R.N.Z.A.F. Bristol

Freighter aircraft running at three-weekly intervals.

In January, 1968, Safe Air Ltd., under an agreement with the Crown, began a regular weekly service between Wellington and Te Hapupu, using Bristol Freighters with specially designed passenger capsules. Up to 20 passengers and half a ton of freight could be carried on each trip.

The demand for seats and for space for mail and freights on the new service increased well beyond what was expected, principally because of the continued growth of the rock lobster fishery. The frequency of the service was increased in 1968 from one to two flights per week. Requests were made for the air service to operate through Christchurch, and a survey of ultimate passenger destinations showed that this was warranted, despite longer flying time, reduced payloads and increased fares. The flight schedule was altered to provide one flight each week on the route Wellington - Hapupu - Christchurch, and one on the Christchurch - Hapupu - Wellington. By the beginning of 1970, a regular service of five flights per fortnight was operating. By mid-1970, however, a decline in the demand for air travel led to a reduction to three flights per fortnight. This is clearly attributable to the stabilising of the rock lobster fishery.

Table 6.2. Statistics of Chathams Air Service 1968 - 70.

	flights	passengers	freight (lbs)	mails (lbs)
1968				
Wn. - C.I.	87	1335	55829	17168
C.I. - Wn.	87	1318	12713	11899
Total	87	2653	68542	29067
1969				
Wn. - C.I.	122	2005	94061	16132
C.I.- Wn.	122	1935	19625	9688
Ch. - C.I.	4	59	2176	1256
C.I.- Ch.	4	113	1528	296
Total	126	4112	117390	27372
1970 (Jan.-May)				
Wn. - C.I.	31	426	17795	4395
C.I.- Wn.	24	463	4352	2527
Ch. - C.I.	24	319	19228	5112
C.I.- Ch.	31	356	2147	4102
Total	55	1564	43522	16136

Wn. - Wellington; C.I. - Chatham Islands;
Ch. - Christchurch.

(Figures supplied by Safe Air Limited).

Table 6.2. shows the rapid increase in the number of flights, passengers, freight and mail carried. It is notable that the number of passengers travelling to the islands exceeds the number leaving by 759. A large proportion of this excess population has taken employment within the fishing industry.

However, the increasing number of flights, and greater movement of people and freights, has done very little towards giving the Chathams a more suitably located airfield, and the obstacle of Te Whanga Lagoon still separates the present airstrip

from the centres of population.

On the other hand, the rock lobster industry, which was mainly responsible for attracting the improved service, has thus provided for the islands their first scheduled, regular air link with the mainland and greatly reduced their isolation. Mails arrive more frequently, and the ties with relatives, friends and businessmen have become less remote. It is unfortunate, though, that the location of Te Hapupu prevents full use of all available air cargo space on flights back to the mainland.

B: Shipping

Despite the new air service - and the establishment of CIMCO which has made special voyages to bring livestock back to the mainland unnecessary - the number of voyages per year has continued to increase. This is due solely to the development of the rock lobster industry. Passengers are now mostly carried by air and there is no longer any need for livestock shipments. This changed situation now meant that the subsidy was, in effect, being paid on the costs of shipping rock lobsters and frozen meat to the mainland, and a re-appraisal of the purpose and extent of Government assistance to Chatham Islands shipping was made. The development of the islands trade made it clear that a vessel with twice the original freezer and bulk fuel oil space of the "Holmdale" was needed. The "Holmdale" was converted accordingly in order to provide a more viable service. The subsidy was ended but the Government agreed to

meet the annual loan repayment charges incurred by the company in the alterations to the ship.

Table 6.3. Chatham Islands Shipping Service

	Number of Trips by Holm & Co.
1969	22
1968	17
1967	15
1966	5

(Source, Holm and Company, Lyttelton).

Part of the high cost of freighting goods by sea is due to the large number of outports which the vessel is required to serve. Waitangi is visited every trip, while Port Hutt is visited on most trips and at least every second trip. Kaingaroa and Pitt Island are visited on approximately every third and fourth trip respectively. Once a year the vessel calls at Waitangi West to uplift wool and set down some general cargo. It is generally not economic to call at any port, with a ship the size of the "Holmdale", to handle less than 400 tons, but to suit the Chatham Islands trade, Holm and Co. go to small ports for much less.

Table 6.4. Cargo discharge, Chatham Islands

port	methods
Waitangi	cross-tee wharf
Port Hutt	barge, fishing vessels
Kaingaroa	surfboat, fishing vessels
Pitt Island	surfboat
Waitangi West	surfboat.

For many reasons the Chathams have never been able to obtain an assured sea freight service, based on a regular and definite timetable, and of sufficient frequency to enable the import and export needs of the islands to be fully provided for. Long-term planning is almost impossible where freight services are indefinite and irregular. Substantial financial losses are sometimes sustained by individuals and companies when production lags or is halted altogether, when spare parts for vital machinery and other necessary materials cannot quickly and easily be obtained. Further settlement and consequent development of the islands is discouraged. Present economic development is creating demands for more labour, especially skilled labour, but people are discouraged from settling in the islands and investing in the future of the islands through hardships. Some of these hardships are inseparable from life in a more isolated area, but others stem from irregular freight services and high freight costs.

Employment and Labour

With the conversion of the Chatham Islands economy from farming, to one based around the fishing industry, many islanders took employment in the factories, and, later, on the boats. At the beginning of 1970, few male Chatham Islanders were working in the processing plants. Generally speaking, those men who were not fishing were farming. Those who were both part-time farmers and part-time fishermen were actually doing very little farming.

However, the processing companies employed large numbers (in Chatham Islands terms) of women. Much of this labour was recruited from among the wives and families of mainland fishermen and company workers, but many local women and girls work in the factories, mainly weighing, wrapping and packing tails, and extracting body meat.

This large scale utilisation of female labour is a new event on the Chathams and has enabled women to attain some degree of financial independence without moving to New Zealand.

There is full employment of men on the Chathams and periodic shortages of labour do occur. Currently, this is due to the gap left in the labour force by small farmers who were formerly available for seasonal work. Skilled workers have always been scarce on the islands. Although the average islander is a good general handyman-mechanic, his accrued practical knowledge and experiences are often insufficient for many specialised tasks which require fully qualified tradesmen, such as builders, carpenters and plumbers. Importing and accommodating tradesmen adds to the expense of any project.

Almost every fishing vessel operating in the Chathams is equipped with a ship-to-shore radio, and some with radar, echo-sounders, radio direction finders and other sophisticated electronic equipment. These require maintenance and repair by experts. So great was the demand for expertise in this field, that one radio and electronics firm sent one of their own men to the islands and installed him in a caravan.

Predictably, the growth of the rock lobster industry has caused a larger than ever representation of Government departments on the islands. The Marine Department has appointed two full-time officers. The Meteorological Office has increased its services, as has Chatham Islands Radio (ZLC). The Post Office staff (including ZLC) clearly shows the effect of the rock lobster industry, especially after 1966. (Table 6.5.).

Table 6.5. Post Office staff (incl. ZLC) at Chatham Islands 1960 - 1970.

	1960	1962	1965	1966	1968	1969	1970
Superintendent	1	1	1	1	1	1	1
Operators	2	2	2	3	5	5	5
Counter clerk	1	1	1	1	1	1	1
Exchange operators		3	3	3	3	3	3
Technicians (radio)			1	1	2	2	2
Postmaster					1	1	1
Linesman						1	1
Total	4	7	8	8	13	14	14

Figures supplied by P.O.H.Q. Wellington.

The amount of traffic has steadily increased from 1965, and since 1968, when a 24-hour 2182 kHz watch was commenced on ZLC, maritime weather transmissions have been broadcast three times daily. Since 1965, various receivers and transmitters have been replaced and upgraded. In 1969, a new hostel was built and the radio station extended to double its original size. Another exchange board was installed in the Post Office in 1970 to cope with the growing demand for telephone service.

In June, 1970, there were 171 telephone subscribers compared with 106 in 1965.

Local businessmen (storekeeper, hotelier, garage proprietors, cartage contractors etc.), have enjoyed much greater business. Hotel requirements increased over 100 per cent for the year ended, March, 1968, while the store proprietor reported a fifty per cent increase over the same period. Subsequent increases have been similarly high. Local business has really benefited from the rock lobster industry. Although many fishermen import their own stores, internal spending has undoubtedly increased.

Education

Rolls for each school on the islands are placed below in Table 6.6. Fluctuations are more apparent in the larger, and therefore more unstable, rolls. The more isolated communities are less affected by the movement of intinerant populations.

Table 6.6. Changes in school rolls - Chatham Islands - 1963 - 70.

	Owenga	Pitt Island	Te Kairakau	Te One
Term I 1970	36	n.a.	n.a.	131
Term III 1969	37	19	15	129
II	29	19	15	117
I	20	19	15	109
Term III 1968	20	12	25	107
II	20	12	23	109
I	20	12	23	107
Term III 1967	18	12	26	106
II	11	12	26	111
I	11	12	23	103

	Owenga	Pitt Island	Te Kairakau	Te One
Term III 1966	11	13	29	97
II	11	13	27	91
I	11	13	24	84
Term III 1965	11	7	27	91
II	10	7	30	79
I	13	7	27	78
Term III 1964	15	10	28	85
II	15	10 (first year)	29	77
I	n.a.		33	72
Term III 1963	n.a.		41	82
II	n.a.		38	85
I	n.a.		36	81

n.a. - not available.

Figures supplied by Education Dept., Christchurch.

The changes in the school rolls at Owenga, Pitt Island and Te One all reflect the growth of the rock lobster industry. In each of these schools, class rolls have increased as the families of fishermen and company employees have settled in the vicinity of the processing factories. The Te One roll also shows the effects of government servants settling at Waitangi.

The Pitt Island school roll has increased substantially since 1965. This is due solely to the return of local families to develop the rock lobster fishery. These people have built homes and show signs of remaining permanently on the island.

On the other hand, Te Kairakau school has had a declining roll for many years and the school has only been kept going by conveying (to the school) several children who live closer to Te One than to Te Kairakau. The Te Kairakau area is declining agriculturally because of small, uneconomic farm units. Any -

developments caused by the rock lobster industry appear to have been only peripheral.

Discussion

It is insufficient to list the changes associated with the rock lobster industry without determining whether these changes have had a beneficial or detrimental effect on the average islander. In other words, have these developments resulted in better services for the islanders - in fact, higher living standards - or have they merely resulted in a continuation of the same, or lower, standards among a larger population.

As a consequence of the information presented so far, and as a result of field experience, it appears that, in general, there has been relatively little participation by the locals in the boom. A vast amount of the financial returns of the industry are directed out of the islands, and the majority of the islanders have not shared in the boom in any constructive way. Up until 1970, with the letting of the major roading contract, the Chathams have not been able to attract large capital investments to materially, and permanently, help their welfare.

While the rock lobster fishery was in its "nascent" stage, it had little effect on the islands. Few settlers arrived. Few extra motor vehicles could be seen on the roads, no factories were built, and, apart from fishing vessels, there was no noticeable increase in external communications.

The islanders began to take part in the boom as the factories were built and their labour was initially required.

Families and fishermen began to settle on the islands with their cottages, caravans and motor vehicles. External communications improved, and internal movements were aided by the presence of helicopters. However, there was still little long-term investment.

By 1969-70, after the flush of the boom had passed, and a period of consolidation had begun, the Chatham Islands had reached the stage where the developments they required were about to appear. In March, 1970, the two-year programme to improve roading and harbour facilities was announced.

This is the kind of development which the Chathams desperately need. The long-term benefits from improved internal communications will be immense. Thousands of acres of first-class land, previously only accessible in summer, will be opened up. The number of outports worked by the "Holmdale" can be reduced, and so ease freight costs. Unused air-cargo space may be utilised. These advantages, and many others, will be complementary, and have cumulative benefits for the islands.

It seems therefore, that the short-term effects of the industry may have been relatively minimal, but the real results of the industry lie in the future, and will depend on the development projects, presently getting under way, not being cut back because of County Council or governmental budgetary reasons. In other words, there is a time-lapse between "developing", as applied to the fishing industry, and actual "development" in the area concerned.

CHAPTER SEVEN

Problems for Development

General

The principal problems arising from what was originally a largely unplanned "boom" can roughly be categorised as:

(a) Provision of adequate accommodation for both men and boats, with resultant fuel, food and water supplies;

(b) Provision of adequate freight and passenger transport;

(c) Avoidance of clashes between islanders and mainland fishermen through a rapid absorption of islanders into the new fishing business;

(d) Provision of some security in the development of the islands to encourage longer-term investment;

(e) Minimisation of the destructive effect of fishing on the non-fishing sector of the islands' economy;

(f) Where to impose limits on boats, permits, catches, gear and catching periods to conserve the resource.

Mention has already been made of the problems of the large number of vessels at the Chathams, using few sheltered anchorages, and having to be continually "on the move" to fresh shelter with changes in the weather.

Adequate air and sea passenger transport appears to have been achieved, but freight transport could be improved in regularity and reliability. The transitional under-provision of accommodation on the Chathams clearly reflects the unprogrammed nature of the whole development process.

The absence of prior infra-structural investment is explicable in the light of:

(a) the impossibility of projecting the medium and long-term size of the fishing industry.

(b) the inability of the islands tax-base, prior to the massive influx of fishermen and factories, to finance the necessary works, and an absence of major financial assistance from the central government, largely explained by (a) above.

In areas subjected to rapid economic development, the new opportunities will initially attract migrants, rather than result in a wave of prosperity for the indigenous population. Numerous world examples of this situation exist. For instance, in many Caribbean and Pacific Islands, tourism has developed in the hands of outside entrepreneurs, who employ indigenous people only to provide a retinue of professional "happy natives", somewhat in the manner of medieval court minstrels. A similar situation has occurred in the recently developed shrimp industry of Honduras and Nicaragua, where all the executive and technical management is in the hands of Americans, and the local inhabitants have benefited little from the new industries. In the short-term, this appears to have been the case in the Chathams.

There is a high turn-over in local island labour which is not yet ready to fully accept the structural master-servant relationship. The highly ambivalent attitude of many Chatham Islanders to mainlanders is common, and is mainly due to the isolated and easy-going social background of the Chatham Islands.

Some observers might be tempted to describe the economy of the Chathams as fundamentally "colonial". Colonial, or former colonial, territories frequently complain that large monopolies have exploited local resources, and, in some cases, continue to do so, without re-investing a just share of the profits in the economy. Similar charges are made against the fishing companies and mainland fishermen. In reply, fishermen and companies state that they are providing hitherto unavailable employment to the local people who had previously shown little initiative in developing the rock lobster industry. They also add that, since the Chatham Islands are part of New Zealand, it is not truly correct to speak of exploitation, because the profits do not necessarily leave New Zealand; on the contrary, they are being transferred to the mainland where capital investment will reap greater returns for the common good.

Despite the current investment in roading and wharf development, certain problems will continue to arrest progress. Among these are underpopulation, the dispersion of the population, land tenure, and certain sociological differences between mainlanders and islanders.

Under-population

The outstanding feature of the Chatham Islands population is its very high birth-rate, which is comparable to that of the New Zealand Maori. Despite this, the total population, up till the rock lobster boom, was progressively declining. In 1936, the population stood at 702, but by 1961 it had dropped to 487.

This has occurred as a result of the young people frequently being drawn to the mainland, either for education, employment, or both. Although there is no evidence to support the contention, it appears that many of those islanders who do not return to the Chathams, are the energetic and eager ones, who stay away for fear of stagnation. On the other hand, it appears that it is the more conservative and less ambitious who tend to remain on the islands or return to their homes.

The small population, even with the influx of fishing personnel, has long caused deep-seated economic problems. Because labour is scarce, farming must be extensive, rather than intensive. There can be little hope for agricultural progress in intensive farming until more agricultural labour is available.

Dispersion of the Population

The wide dispersion of a limited population, and the lack of concentration of people in any closely defined area, discourages immigration of new residents on a permanent basis. Essential services, such as police, Post Office, health and education, are quite good, but the small population prevents much extension of facilities and community services. Few mainlanders will give up community services to which they are accustomed and go to the Chathams. Most New Zealand housewives would not "take too kindly" to wearing gumboots the whole winter through, and to being faced with periodic shortages of provisions.

This situation will become less favourable as the standard

of living on the mainland continues to rise, while on the Chathams it stays much the same. The problem is thus a vicious circle; population growth is needed before services will be improved, but, the population will not increase much through immigration until community services are more attractive.

.Land Tenure Problems.

Another "major obstacle to development is that of land tenure, which threatens to stultify any enterprise for many years" (Elliott, 1956 p.171). Large areas await attention by the Native Land Court, and meanwhile, are held on short lease and are not utilised as efficiently as they should be. Either lying idle or overstocked, they form a striking contrast to areas held on long lease or freehold. Many farms are subdivided on the death of the owner, resulting in non-economic units. For development, these units must be consolidated, but land is very tightly held by the islanders, as is clearly shown by the fact that, apart from one sale, in 1969, to a processing firm which bought land in order to prevent competitive establishments on Pitt Island, there has been no sale of farm land since 1967.

If the land problems can be solved, the projected roading developments will greatly assist agriculture.

Sociological Obstacles

Reference to apparent apathy among Chatham Islanders is not uncommon. They are often accused of being lazy, lethargic, and suffering from "islanditis", a condition which prevents urgency and initiative.

There appears to be rather basic sociological differences,

between mainlanders and islanders, which have presented obstacles to development. Many mainlanders visit the Chathams and often develop feelings, or adhere to preconceived ideas, that are detrimental to communication with local residents and officials. In brief, there appears to have been a failure, on the part of many mainlanders, to understand that the locals have a distinct culture of their own. There are, undoubtedly, large areas of similarity with mainland culture, but there are definite, fundamental differences. These show most clearly in mutually discordant conceptions of time, money, progress and standards of living. Frustration among mainlanders is almost inevitable when this point is not appreciated.

However, the ability of Chatham Islanders to meet domestic needs by their own efforts has tended to make a large number of the islanders content with standards which could be much improved by some local effort which would serve as an active concomitant to the passive acceptance of the many services now provided by government funds.

Conclusion

A survey of all the potentialities of the Chathams reveals no individual drawback that cannot be overcome. The problem remains as to the cost of overcoming these drawbacks. As mentioned, government expenditure in the area over the last three years has averaged over $500,000 per year, which, on a per capita basis, would be equal to spending approximately $170 million on the population of Christchurch. Despite this great expense, the Chathams should not be abandoned as has periodically

been suggested. The islanders themselves are very strongly attached to their land and have great faith in their islands' future.

On the other hand, the dead weight of isolation will continue to overlay all efforts of development and progress. However, it must be hoped that some of the momentum generated from the rock lobster industry will be sustained, because the fate of the islands may well be decided, in the future, by the long-term benefits derived from fishing. One would expect that a more diversified fishing industry based on rock lobsters, shellfish and wet fish, will become increasingly a resident-population activity. This will undoubtedly attract some new settlers, and will provide for the islands a continuing source of employment and income at a level that will not be detrimental to non-fishing activities, but, with farming, provide a sound, dual economic base.

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